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Subject: Residential Risk Assessment for the Proposed New Use of Myclobutanil on Home Garden Fruit Trees, Nut Trees, Berries, Mint and Vegetables

DP Barcode	PC Code:	Trade Name:	EPA Reg #	MRID#s	Class
D319227	128857	Chemsico Fungicide M	9688-123	404893-02 449529-01	Fungicide

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Introduction

The registrant, Chemsico, requests a label amendment to add home garden uses on almonds, apples, mayhaw, berries, grapes, peppermint, spearmint, stone fruits, strawberries, asparagus, cucurbits, snap beans and tomatoes to the Chemsico Fungicide M label. This memorandum addresses residential risk from these proposed uses and also includes updated assessments for the existing residential uses of other products and formulations on turf and ornamentals. These assessments have been updated using exposure factors from ExpoSAC Policy #12 "Recommended Revisions to the Standard Operating Procedures for Residential Exposure Assessments".

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Executive Summary

Use Information

Myclobutanil is a contact fungicide which is applied to prevent fungal outbreaks. In agricultural and commercial settings it has a variety of uses including fruits, vegetables, ornamentals and turf. In the residential setting, the existing uses include turf and ornamentals. The proposed new uses include home garden uses on fruit trees, nut trees, berries, mint and vegetables.

Hazard Summary

The results of acute toxicity testing indicate that technical myclobutanil is a severe eye irritant (i.e. Tox I) and a dermal sensitizer.

The following NOAELs were used for assessing myclobutanil residential risks:

Exposure Route and Duration	Dose in mg/kg/day (Endpoint)
Dermal - short/intermediate term	10 (testicular atrophy, stillborn pups, decreased body weight gain)
Inhalation - short/intermediate term	Same as above for dermal
Incidental Oral - Acute	Not required - no effects attributable to a single dose.
Incidental Oral - short/intermediate term	Same as above for dermal

The same NOAEL of 10 mg/kg/day was used for assessing short/intermediate term dermal, inhalation and incidental oral exposures. This NOAEL is from a 2 Generation Reproduction Toxicity study in rats during which testicular atrophy, an increase in the number of still born pups and decreased body weight gain during lactation were observed with a LOAEL of 50 mg/kg/day. An dermal absorption factor of 50% was used because the dermal NOAEL was based upon a oral study. Chronic exposures are not expected due to the seasonal and intermittent nature of the existing and proposed uses.

The target MOE is 100 for residential exposure and it includes the standard safety factors of 10 to account for intraspecies variability and 10 for interspecies variability. Additional safety factors to account for FQPA concerns were not needed.

Residential Handler Risk Summary

The risks of residential handlers applying myclobutanil to vegetables, ornamentals, fruit trees and turf was assessed using PHED data for the back pack sprayer, ORETF study data for the low pressure handwand sprayers and standard assumptions for the amount treated. The residential handler MOEs for myclobutanil were not of concern because they exceeded the target MOEs of 100.

Home Garden Post Application Risk Summary

Data Sources - Two dislodgeable foliar residue (DFR) studies on grapes in California were used to assess the home garden exposures. The studies were reviewed by HED and were found to meet most of the series 875 guidelines for post application exposure monitoring. The studies were done using airblast sprayers while the proposed home garden applications would be made with low pressure hand wand or hose end sprayers. Based upon experience with other fungicides, such as the EBDCs, however, it is anticipated that DFRs that would result from handwand applications would be similar to DFRs from airblast applications. The initial DFR was assumed to be 23 percent of the application rate and was based upon DFR Data for HS-1760 Site 3.

Risks - The post application risks were assessed using the DFR data described above along with the transfer coefficients and exposure duration assumptions from the Residential SOPs The MOEs exceeded the target MOE of 100 for all of the home garden post application scenarios.

Pick Your Own Post Application Risk Summary

"Pick Your Own" exposures can occur at a commercially operated "Pick Your Own" strawberry farms and orchards where Myclobutanil has been applied. The post application risks were assessed using the DFR data described above for the home garden post application risks along with the transfer coefficients and exposure duration assumptions from the Residential SOPs The MOEs exceeded the target MOE of 100 for all of the Pick Your Own post application scenarios.

Residential Turf Risk Summary

Data Sources - A turf transferable residue (TTR) study was used to assess the turf exposures. The field portion of this study was in North Carolina and California. This study was reviewed by HED and were found to meet most of the series 875 guidelines for post application exposure monitoring. The initial TTR for dermal exposures was assumed to be 2.4 percent of the application rate and was based upon an average of the DAT 0 and DAT 0.3 data for the California site.

Risks - The risks for myclobutanil post application turf exposure were calculated using the TTR data described above and standard assumptions from the Recommended Revisions to the Residential SOPs. The myclobutanil MOEs for toddler exposures at day 0, expressed as the total MOE, is 60 when the application rate is 1.36 lb ai/acre and it is 140 when the application rate is 0.62 lb ai/acre. The dermal pathway is the risk driver which causes the total MOE to be below the target MOE of 100 at the higher application rate. The myclobutanil MOEs for adult dermal exposures are above 100 regardless of which application rate is used. The high rate of 1.36 lb ai/acre is from the Eagle 20EW label (62719-463) that appears to be primarily intended for turf use on golf courses. The risk could be refined if a label statement could be added to prohibit application to residential lawns.

Risk Characterization

It should noted that the myclobutanil MOEs do not account for eye irritation or skin sensitization, which may be of concern because technical myclobutanil (95.5% a.i.) is a severe eye irritant and a skin sensitizer. It is not known if the home garden products, which are fomulated at lower concentrations (1.55% a.i.), are also severe eye irritants or skin sensitizers. Even if the home garden products are less toxic because they are dilute, the resulting residues on home garden vegetables, fruit trees and turf would be concentrated following the evaporation of the carrier and could be as toxic as the technical.

1.0 Residential Exposure/Risk Assessment

This document is the residential nondietary exposure and risk assessment in support of the proposed home garden uses of myclobutanil. This memorandum addresses residential risk from these proposed uses and also includes updated assessments for the existing residential uses of other products on turf and ornamentals. These assessments have been updated to incorporate exposure factor changes that have taken place since the last myclobutanil residential exposure assessment was completed (D264191 of 7 March 2000).

1.1 Hazard Concerns

The results of acute toxicity testing are given in Table 1. These results indicate the myclobutanil technical is a severe eye irritant and a dermal sensitizer.

Table 1 - Myclobutanil Acute Toxicity

Guideline No.	Study Type	MRID #(S)	Results	Toxicity Category
81-1	Acute Oral	00141662	LD_{50} = 1.6 g/kg (M) LD_{50} = 2.29 g/kg (F)	III
81-2	Acute Dermal	00141663	LD_{50}> 5000 mg/kg	IV
81-3	Acute Inhalation	40357101	LC_{50} > 5.1 m/L	IV
81-4	Primary Eye Irritation	00141663	Severe eye irritant	I
81-5	Primary Skin Irritation	00141663	Non-irritating to skin	IV
81-6	Dermal Sensitization	40357102	Positive sensitizer	N/A

The toxicological endpoints that were used to complete the residential risk assessments for myclobutanil are summarized in Table 2. The same NOAEL of 10 mg/kg/day was used for assessing short/intermediate term dermal, inhalation and incidental oral exposures. This NOAEL is from a 2 Generation Reproduction Toxicity study in rats during which testicular atrophy, an increase in the number of still born pups and decreased body weight gain during lactation were observed with a LOAEL of 50 mg/kg/day. An dermal absorption factor of 50% was used because the dermal NOAEL was based upon a oral study. Chronic exposures are not expected due to the seasonal and intermittent nature of the existing and proposed uses.

HED's level of concern for non-cancer risks (i.e. the target MOE) is defined by the uncertainty factors that are applied to the assessment. The target MOE for the myclobutanil residential exposures is 100 which includes the factors of 10 to account for interspecies extrapolation to humans from the animal test species and the factor of 10 to account for intraspecies sensitivity variation. No additional database or FQPA factors are needed.

Table 2 - Myclobutanil Toxicological Endpoints Used for Residential Risk Assessment			
Exposure Duration (Routes)	**Dose (mg/kg/day)**	**Target MOE**	**Study and Toxicological Effects**
Acute Dietary (general population)	None	N/A	N/A
Short/Intermediate Term (Dermal, Inhalation and Incidental Oral)	NOAEL= 10	100	2 Gen. Reproduction Toxicity -rat LOAEL = 50 mg/kg/day based on [atrophy of the testes and prostate as well as an increase in the number of stillborn pups and a decrease in pup weight gain during lactation.]
Long-Term (Dermal, Inhalation and Incidental Oral)	NOAEL= 2.5	100	Chronic Toxicity/ Carcinogenicity - rat LOAEL = [9.94] mg/kg/day based on [decreased testicular weights and increased testicular atrophy.]
1. Oral endpoints were used for dermal exposure, therefore a dermal absorption factor of 50% was used. 2. Oral endpoints were used for inhalation exposure, therefore an inhalation absorption factor of 100% was used. 3. The target MOE for residential exposures includes the applicable FQPA safety factors. 4. Short term = 1 to 30 days, Intermediate term = 31 to 180 days and Long term = more than 180 days			

1.2 Use Profile

Myclobutanil is a contact fungicide which is applied to prevent fungal outbreaks. In the agricultural and commercial settings it has a variety of uses including fruits, vegetables, ornamentals and turf. In the residential setting, the existing uses include turf and ornamentals. The proposed new uses include home garden uses on berries, grapes, peppermint, spearmint, strawberries, asparagus, cucurbits, snap beans and tomatoes and home orchard uses on almonds, apples, mayhaw and stone fruits. A listing of the application rates for the existing and proposed new uses is given in Table 3.

Table 3 - Myclobutanil Application Rates				
Crop	**Agricultural and Commercial Application Rate (lb ai/acre)**	**Home Garden Application Rate* (oz product per gallon)**	**Spray Volume (gallons per acre)**	**Home Garden Application Rate (lb ai/acre)***
Asparagus	0.125	1.25	100^{+}	0.127
Almonds	N/A	0.5	400^{+}	0.20
Berries (Blackberries/Raspberries)	0.0625	0.66	100^{+}	0.067
Conifer Trees	0.25	3.0	100^{+}	0.30

Table 3 - Myclobutanil Application Rates				
Crop	**Agricultural and Commercial Application Rate (lb ai/acre)**	**Home Garden Application Rate* (oz product per gallon)**	**Spray Volume (gallons per acre)**	**Home Garden Application Rate (lb ai/acre)***
Curcurbits	0.125	1.25	100+	0.127
Pome Fruit (Apple and Mayhaw)	0.25	0.66	400+	0.27
Grapes	0.125	1.25	100+	0.127
Mint (Peppermint and Spearmint)	0.125	1.25	100+	0.127
Ornamentals	0.25	2.0	100+	0.2
Snap Beans	0.125	1.25	100+	0.127
Strawberries	0.125	1.25	100+	0.127
Stone Fruit (Apricot, Nectarine, Cherry, Peach, Plum and Prune	0.15	0.5	400+	0.20
Tomato	0.1	1.0	100+	0.10
Turf	1.36	7.0	87*	0.62
+ Assumed * Specified on Chemsico Fungicide M Label (9688-123)				

2.0 - Residential Handler Exposures and Risks

The anticipated use patterns and current labeling indicate that a variety of application equipment could be used by the homeowner to apply myclobutanil to ornamental plants, shrubs, fruit trees, home garden vegetables and lawns, therefore, the following scenarios were assessed.

1 - Aerosol Spray Can Application to Ornamentals and Fruit Trees
2 - Hose End Sprayer Application to Ornamentals and Fruit Trees
3 - LP Handwand Application to Ornamentals
4 - LP Handwand Application to Vegetables
5 - RTU Sprayer Application to Vegetables
6 - Hose End Sprayer Application to Vegetables
7 - Hose End Sprayer - Mix Your Own - Application to Turf
8 - Hose End Sprayer - Ready to Use - Application to Turf
9 - Belly Grinder Application to Turf
10 - Broadcast Spreader Application to Turf

2.1 - Residential Handler Exposure Data

Unit exposure data were either taken from the Pesticide Handlers Exposure Database (PHED) PHED or the home garden and turf application studies that were sponsored by the ORETF. A listing of the unit exposure data used for each scenario is given in Appendix A.

2.2 - Residential Handler Exposure Assumptions

The assumptions and factors used in the risk calculations include:

- Both the proposed uses on the Chemsico Fungicide M Label and existing uses on other myclobutanil labels were assessed. These other labels include granular and aerosol can products that are used on turf and ornamentals.

- The application rates for the new uses were taken from the proposed Chemsico fungicide label and are roughly the same as the rates on agricultural and commercial labels if the spray volume is 87 gallons per acre (GPA) for turf, 100 GPA per acre for most crops and 400 GPA for fruit trees. A listing of these rates is included in Table 3.

- The application rates for the existing uses were taken from the existing labels.

- The area treated per day (1000 square feet) was taken from ExpoSac Policy #12 "Recommended Revisions to the Standard Operating Procedures for Residential Exposure Assessments" of 2/22/01. This value is based upon the results of the National Home Garden Survey and is applicable for the four application methods considered.

2.3 Residential Handler Risk Estimates

The residential handler exposures and MOEs were calculated as detailed in Appendices A and B. The dermal and inhalation MOEs were combined because the dermal and inhalation endpoints were selected from the same oral study and are summarized in Table 4. The MOEs for all of the scenarios exceed the target MOE of 100 which indicates that the risks are not of concern.

Table 4 - Myclobutanil Residential Handler Risks

Exposure Scenario (all are mix/load/apply)	Use Site	Application Rate	Amount Used or Area Treated	Absorbed Daily Dose (mg/kg/day)	Combined MOE
Aerosol Spray Can	Ornamentals	0.012% ai per 15 ounce can	1 can per day	0.00018	55000
Hose End Sprayer	Ornamentals Fruit Trees Nut Trees Grapes	0.25 lb ai/acre	0.023 acre/day (1000 square feet)	0.0016	6200
LP Handwand				0.0023	4300
LP Handwand	Vegetables	0.125 lb ai/acre	0.023 acre/day	0.00078	13000

Table 4 - Myclobutanil Residential Handler Risks					
Exposure Scenario (all are mix/load/apply)	**Use Site**	**Application Rate**	**Amount Used or Area Treated**	**Absorbed Daily Dose (mg/kg/day)**	**Combined MOE**
RTU Sprayer	Berries Mint		(1000 square feet)	0.0011	9000
Hose End Sprayer				0.00070	14000
Hose End Sprayer - Mix Your Own	Turf	1.36 lb ai/acre	0.5 acre/day	0.054	185
Hose End Sprayer - Ready to Use				0.0130	785
Hose End Sprayer - Mix Your Own	Turf	0.62 lb ai/acre	0.5 acre/day	0.0250	370
Hose End Sprayer - Ready to Use				0.0059	1600
Belly Grinder	Turf	1.36 lb ai/acre	0.023	0.0250	410
Broadcast Spreader			0.5	0.0033	3000

2.4 Residential Handler Risk Characterization

The MOEs for residential handlers range from 185 to 55,000 with the highest risks (i.e. the lowest MOEs) associated with the mixing, loading and applying myclobutanil to turf with a mix your own hose end sprayer at the highest rate of 1.36 lb ai/acre. With the lower application rate of 0.62 lbs ai/acre, the lowest MOE is 370.

3.0 Home Garden Post Application Exposures and Risks

Home garden post application exposures can occur when home gardeners perform tasks such as weeding, pruning or hand harvesting following the application of myclobutanil. To address these risks, the following two scenarios were assessed based upon the Residential SOP 3.0 for Garden Plants and SOP 4.0 for Trees:

Post Application Exposure in Home Gardens
Post Application Exposure in Home Orchards

3.1 Home Garden Post Application Exposure Data

Two dislodgeable foliar residue (DFR) studies were used to assess the home garden exposures. The studies were reviewed by HED and were found to meet most of the series 875 guidelines for post application exposure monitoring. The studies are summarized below and the data analyses are included in Appendix C.

"Determination of Dislodgeable Residues of Myclobutanil on Grape Foliage", MRID 404893-02; November 9, 1987; W.J. Zogorski, Performing Laboratory: Rohm and Haas Company.

This study measured myclobutanil DFRs following airblast application of Rally 60DF to grapes at three vineyards located in the central valley of California. Five applications of 0.075 to 0.125 lb ai/acre to yield a total of 0.5 lb ai/acre were made 16 to 30 days apart with a spray volume of 100 to 200 gallons per acre (GPA).

Triplicate DFR samples were collected out to 35 days using the Iwata method to yield a total double sided leaf surface area of 608 cm^2 per sample. The leaf disk samples were sealed in a jar and were placed in wet ice storage until extraction which occurred as soon as possible after completion of each sample collection. The leaf disks samples were extracted three times in 100 ml of an aqueous solution of 0.01 percent Sur-Ten wetting agent to yield a total extract of 300 ml. This extract was capped, frozen in dry ice and shipped to the lab for analysis. Field spikes and controls were prepared using separate leaf punches. The samples were analyzed using a GC equipped with a Thermionic detector using a method that had been validated to an LOD of 0.0002 ug/cm^2.

Quality control data indicated good laboratory and field recovery. The average laboratory recovery was 103 $\pm$ 6.0 percent (n=25) and did not vary with respect to fortification level which ranged from 0.008 to 0.033 ug/cm^2. The average field recovery was 95 $\pm$ 8 (n=44) percent with a fortification level of 0.025 ug/cm^2. The field fortification samples were analyzed concurrently with the DFR samples. The DFR results were not adjusted for either laboratory or field recovery.

The results of this study are summarized in Table 5. All of the results were 35X or more above the LOD at all sampling intervals while the control samples were below the LOD. The DAT 0 residues ranged from 0.16 to 0.19 ug/cm^2 with an average of 0.18 ug/cm^2. The percent transferable residue ranged from 7.8 to 11.5 when the results were corrected for pre DAT 0 residues that resulted from the previous applications. The percent transferable residue ranged from 11.3 to 13.4 percent when the results were not corrected.

Table 5 - Dissipation of Myclobutanil Applied to Grapes in California (MRID 404893-02)

Site	Application Rate (lb ai/acre)	DAT 0 DFR (ug/cm^2)	Percent Transferable Residue	Correlation Coefficient	Half Life (days)
McFarland	0.125	0.16	10.7 (C), 11.3(NC)	0.98 (n=10)	7.2
Earlimart	0.125	0.18	11.5 (C), 12.8(NC)	0.98 (n=10)	9.5
Madera	0.125	0.19	7.8 (C), 13.4 (NC)	0.93 (n=10)	7.2
Avg		0.18	10 (C), 12,5 (NC)		8.0

C = Corrected for previous residues
NC = Not corrected for previous residues

"Dislodgeable Foliar Residues Following Reduce-Volume and Conventional Myclobutanil Application to Grapes," HS-1760, *August 2000; Welsh et. al., California Environmental* Protection Agency, Dept of Pesticide Regulation.

This study measured myclobutanil DFRs following airblast application of Rally 40WP to grapes at five vineyard sites located in California. Applications were made with both conventional airblast sprayers and reduced volume electrostatic sprayers, however, only the data for conventional sprayer are considered here because the reduced volume methods are less applicable to the home garden. No applications were made prior to the initiation of the study at sites 2 and 3 while three to four applications were made to sites 1, 4 and 5. Applications began at pre-bloom with approximate 18 day treatment intervals. The application rate was 0.1 b ai/acre with a spray volume of 80 to 100 gallons per acre (GPA). No rainfall occurred at any of the sites and irrigation was provided using drip irrigation which did not affect the foliage.

Quadruplicate DFR samples were collected out to 14 to 26 days using the Iwata method to yield a total double sided leaf surface area of 400 cm^2 per sample. Samples were collected from both the inside and outside regions of the leaf canopy. The leaf disk samples were sealed in jars stored on ice until extraction at the laboratory which occurred within 24 to 48 hours after collection. The leaf disks samples were extracted three times in 50 ml of a dilute aqueous solution Aerosol OT-75 wetting agent to yield a total extract of 150 ml. Quality control samples were prepared by fortifying blank extracts in the laboratory. Field fortification samples were not prepared. The samples were analyzed using either a GC equipped with a Ion Trap Detector (Site 1) or HPLC equipped with a UV detector (all other sites). Both methods were validated with LODs of 0.0125 ug/cm^2 for sites 1 and 2, 0.005 ug/cm^2 for sites 3 and 4 and 0.0075 ug/cm^2 for site 5 .

The average laboratory recovery from the fortification of blank extracts was 104 ± 18 (n=59) with a range of 77.1 to 171.2 percent. The recoveries did not vary with respect to analytical method (GC or HPLC) or fortification level (which ranged from 0.025 to 0.50 ug/cm^2). The DFR results were not adjusted for laboratory recovery.

The results of this study are summarized in Table 6. The DFR sample results were generally above the LOD at all sampling intervals while the control samples were below the LOD. The DAT 0 residues ranged from 0.19 to 0.26 ug/cm^2 with an average of 0.20 ug/cm^2. The percent transferable residue at previously treated sites ranged from 7.8 to 13 percent when the results were corrected for pre DAT 0 residues that resulted from the previous applications. The percent transferable residue ranged from 11.3 to 15.2 percent when the results were not corrected. The highest percent transferable residue (23.5 percent) occurred at site 3 which was not treated with myclobutanil prior to the study.

Table 6 - Dislodgeable Foliar Residues Following Myclobutanil Applied to Grapes in California (HS-1760)						
Site	**Application Rate (lb ai/acre)**	**Pre App DFR (ug/cm^2)**	**DAT 1 DFR (ug/cm^2)**	**Percent Transferable Residue**	**Correlation Coefficient**	**Half Life (days)**
1	0.1	0.084	0.19	9.1 (C), 16.6(NC)	0.96 (n=24)	16
3	0.1	N/A	0.26	23.5 (NC)	0.95 (n=20)	14
4	0.1	0.040	0.17	11.3 (C), 14.9 (NC)	0.91 (n=16)	9.1
5	0.1	0.073	0.19	10.2 (C), 16.6 (NC)	0.87 (n=20)	17
C = Corrected for previous residues NC = Not corrected for previous residues. No previous applications were made at Site 3.						

Application of the DFR Study Data to the Home Garden Exposure Scenarios

The two available studies were done using airblast sprayers while the proposed home garden applications would be made with low pressure hand wand or hose end sprayers. Based upon experience with other fungicides, such as the EBDCs, however, it is anticipated that DFRs that would result from handwand applications would be similar to DFRs from airblast applications. In the case of mancozeb, for example, the percent transferable residues were 22.1 $\pm$ 7.9 (n=6) for airblast applications, 18.3 $\pm$ 2.0 (n=3) for groundboom applications and 11.7 (n=1) for high pressure hand wand application.

The DFR data for HS-1760 Site 3 were used to assess home garden post application exposures. It is acknowledged that this DFR may represent high end residues, however, it was chosen because there was no indication in the study report that it represented atypical conditions.

3.2 Home Garden Post Application Exposure Assumptions

The following assumptions and exposure factors were used for assessing home garden post application risks:

- The maximum label rates as listed in Table 3 for each crop was used for all of the calculations as there are no use data available for home gardeners.
- The transfer coefficient is 10,000 cm^2/hr as stated in the Residential SOPs.
- The daily exposure duration for tasks performed in the home garden or home orchard are expected to be 40 minutes per day as stated in the Residential SOPs;

3.3 Home Garden Post Application Risk Estimates

The Myclobutanil MOEs are summarized in Table 7 and the calculations are included in Appendices A and D. The Myclobutanil MOEs for all of the home gardener post application scenarios are greater than the target MOE of 100 and are not of concern.

Table 7 - Myclobutanil Post Application Risks for Home Gardeners

Crop	Application Rate (lb ai/acre)	DAT 0 DFR (ug/cm^2)	Transfer Coefficient (cm^2/hr)	Exposure Time (hours/day)	Dose (mg/kg/day)	Dermal MOE
Home Garden Ornamental Plants and Vegetables	0.25	0.65	10000	0.67	0.031	320
Home Orchard Fruit Trees	0.25	0.65	10000	0.67	0.031	320

3.4 Home Garden Post Application Risk Characterization

The risks for home gardeners is conservative because it is based upon a screening level transfer coefficient and a dermal absorption factor of 50 percent.

4.0 "Pick Your Own" Post Application Exposures and Risks

"Pick Your Own" exposures can occur at a commercially operated "Pick Your Own" strawberry farms and orchards where Myclobutanil has been applied. To address these risks, the following two scenarios were assessed based upon the Residential SOP 15.0 for "Pick Your Own" Strawberries:

Post Application Exposure for Pick Your Own Strawberries
Post Application Exposure for Pick Your Own Tree Fruit

4.1 Pick Your Own Post Application Exposure Data

The DFR data that were used for the home gardener post application risks were also used to assess "Pick Your Own" Exposures. These are discussed in Section 3.0 above.

4.2 Pick Your Own Post Application Exposure Assumptions

The following assumptions and exposure factors were used for assessing "pick your own" post application risks:

- The maximum label rates as listed in Table 3 for strawberries and tree fruit was used.
- The transfer coefficient is 10,000 cm^2/hr as stated in the Residential SOPs.
- The daily exposure duration for "pick your own" strawberries is 4 hours as stated in the Residential SOPs;
- The daily exposure duration for "pick your own" tree fruits is 2 hours.

3.3 Pick Your Own Post Application Risk Estimates

The Myclobutanil MOEs are summarized in Table 8 and the calculations are included in Appendix D. The Myclobutanil MOEs for the "pick your own" scenarios are greater than the target MOE of 100 and are not of concern.

Table 8 - Myclobutanil Post Application Risks for Pick Your Own Crops

Crop	Application Rate (lb ai/acre)	DAT 0 DFR (ug/cm^2)	Transfer Coefficient (cm^2/hr)	Exposure Time (hours/day)	Dose (mg/kg/day)	Dermal MOE
Fruit Trees	0.25	0.65	10000	2	0.093	110
Strawberries	0.125	0.325	10000	4	0.093	110

4.3 Pick Your Own Post Application Risk Characterization

The risks for pick your own exposures are conservative because they are based upon a screening level transfer coefficient and a dermal absorption factor of 50 percent. The risks could be refined by examining the recently submitted ARTF transfer coefficient studies and calculating TCs that match the clothing worn by pick your own customers.

5.0 - Residential Turf Post Application Exposure and Risks

The following exposure scenarios are assessed for residential post application risks:

Toddlers Playing on Treated Turf
Adults Performing Yardwork on Treated Turf
Adults Playing Golf on Treated Turf

5.1 Residential Turf Post Application Exposure Data

A turf transferable residue (TTR) study was used to assess the turf exposures. The field portion of this study was conducted by Grayson Research LLC of Creedmoor, North Carolina and Research for Hire of Porterville, California. The laboratory analysis for all three studies was conducted by Rohm and Haas Company of Springhouse, Pennsylvania. This study measured the dissipation of myclobutanil using the ORETF roller technique (also called the modified California Roller). This study was reviewed by HED and were found to meet most of the series 875 guidelines for post application exposure monitoring. The study is summarized below and the data analyses are included in Appendix C.

Determination of Transferable Residues on Turf Treated with Myclobutanil, MRID 449529-01

Myclobutanil (Eagle WSP) was applied at a rate of 1.31 lbs ai/acre to Bermuda grass turf plots in North Carolina and Fescue turf plots California using groundboom sprayers with a spray volume of 43.6 gallons per acre. The bermuda grass plots were maintained at a height of 1.25 to 2.5 inches and the fescue plots were maintained at a height of 2 to 4 inches; however, no mowing was required after the final application at either site. No rainfall occurred at the California site and it was irrigated six days after the final application with 0.75" of water. Rainfall occurred starting on DAT 2 at the NC site and irrigation was not applied. The rainfall amounts were 0.04" on DAT 2, 0.06" on Dat 3, 0.01" on DAT 4, 0.09" on 0.15 on DAT 8, 0.03" on DAT 9 and 0.41" on DAT 14.

Sampling was conducted with a ORETF roller using a 27" X 39" percale cotton cloth in accordance with the SOP developed by the ORETF. The NC samples were collected after the sprays had dried then at 0.3, 1, 4, 5, 7, 10 and 14 Days after Treatment (DAT). The CA samples were collected after the sprays had dried then at 0.3, 1, 2, 4, 5, 7, 10 and 14 DAT. The samples were analyzed using a validated method that had an LOQ of 0.027 ug/cm^2. The concurrent laboratory recoveries were close to 100 percent and were acceptable. The average field recoveries were acceptable with a range of 91.6 to 94.6 percent depending upon the site and fortification level. The TTR values were corrected using a method recovery factor of 0.977.

The results are shown in Table 9. The pre-application TTRs were below the LOQ at both sites. The initial TTRs were based upon the average of the DAT 0 and DAT 0.3 values. The TTR levels declined to the LOQ by DAT 4 at the NC site and by DAT 7 at the CA site. The decline at the NC may have corresponded to the rainfall that occurred prior to the DAT 4 sample

but this could not be confirmed because there were no samples collected on DAT 2 or 3. The decline at the CA site was abrupt and seemed to correspond with the irrigation that occurred on DAT 6. The calculated correlation coefficient for the NC site was 0.98, however, this may be an artifact of the missing data between DAT 1 and Dat 4. The correlation coefficient for the CA site was 0.41 when all data were considered and 0.84 when two outlier data points were excluded. The outlier data points were replicate C on DAT 0 which was 0.186 ug/cm^2 (replicates A and B were 0.361 and 0.336 ug/cm^2) and Replicate C on DAT 0.33 which was 0.547 ug/cm^2 (replicates A and B were 0.323 and 0.348 ug/cm^2).

Table 9 - Dissipation of Myclobutanil Applied to Turf

Site	Application Rate (lb ai/acre)	Initial TTR (ug/cm^2)	Percent Applied as TTR	Correlation Coefficient	Half Life (days)
North Carolina	1.31	0.16 ± 0.032 (n=6)	1.1	0.98 (n=12)	1.1
California - All Data Considered	1.31	0.36± 0.12 (n=6)	2.4	0.41 (n=15)	N/A
California - Outliers Excluded	1.31	0.34± 0.016 (n=4)	2.4	0.84 (n=13)	8.5

Note - The Initial TTR is calculated as the average of the DAT 0 and DAT 0.3 TTR values.

5.2 Residential Turf Post Application Exposure Assumptions

- The turf exposures were considered to be short/intermediate term in duration because myclobutanil can be used only 16 times per year and dissipates fairly rapidly with a half life of 8.5 days. Acute exposures from granule ingestion were not assessed because there is no endpoint for acute dietary exposures for the general population which includes children.

- The application rates of 0.62 and 1.36 lb ai per acre were used for calculating short/intermediate term risks. The rate of 0.62 lb ai./acre is from the Chemsico product labels (such as 9688-123 and 9688-165) and the rate of 1.36 lb ai acre is from non-Chemsico labels (such as 62719-463).

- The initial TTR for dermal exposures was assumed to be 2.4 percent of the application rate and was based upon an average of the DAT 0 and DAT 0.3 data for the California site. All of the data, including the two outliers, were included in this average, however if the outliers had not been included, the TTR would still have been the same (2.4 percent) because the outliers offset each other.

- Five percent of the application rate has been used to calculate the 0-day residue levels used for defining risks from hand-to-mouth behaviors, measured TTR values are not used because of differences in transferability versus what would be expected during hand-to-mouth behaviors;

- Twenty percent of the application rate has been used to calculate the 0-day residue levels used for defining risks from object-to-mouth behaviors, measured TTR values are not used because of differences in transferability versus what would be expected during object-to-mouth behaviors, a higher percent transfer has been used for object-to-mouth behaviors because it involves a teething action believed to be more analogous to DFR/leaf wash sample collection where 20 percent is also used;

- The Jazzercise approach is the basis for the dermal transfer coefficients as described in HED's Series 875 guidelines, *SOPs For Residential Exposure Assessment*, and the 1999 FIFRA SAP Overview document. This approach was used for toddlers on turf and adults on athletic fields.

- Soil residues are contained in the top centimeter and soil density is 0.67 mL/gram;

- Three year old toddlers are expected to weigh 15 kg;

- Hand-to-mouth exposures are based on a frequency of 20 events/hour and a surface area per event of 20 cm^2 representing the palmar surfaces of three fingers;

- Saliva extraction efficiency is 50 percent meaning that every time the hand goes in the mouth approximately ½ of the residues on the hand are removed;

- Risk values (i.e., MOEs) for the different kinds of toddler exposures to turf (dermal, hand-to-mouth, object-to-mouth, and soil ingestion) were added together per HED policy as discussed in the ExpoSac Meeting Minutes. These exposures are typically added together when chemicals are used on turf because it is logical they can co-occur.

- Golfers have been assessed using a transfer coefficient of 500 cm^2/hour.

- For golfer assessment it was assumed that the tees, greens and fairways are treated and that the exposure time per day would be four hours.

5.3 - Residential Turf Post Application Risk Estimates

The myclobutanil MOEs for toddler exposures are summarized in Table 10 and the calculations are included in Appendices A and E. The total MOE is below 100 when the application rate is 1.36 lb ai/acre and it is above 100 when the application rate is 0.62 lb ai/acre. The dermal pathway is the risk driver which causes the total MOE to be below 100 at the higher

application rate. The myclobutanil MOEs for adult dermal exposures are summarized in Table 11. The dermal MOEs are above 100 regardless of which application rate is used.

Table 10 - Toddler MOEs for Exposure to Turf Treated with Myclobutanil								
Exposure Scenario	**Application Rate (lbs ai/acre)**	**Dermal TTR (ug/cm^2)**	**Dermal Dose**	**Hand-to Mouth Dose**	**Object to Mouth Dose**	**Soil Ingestion Dose**	**Total Dose (mg/kg/day)**	**Total MOE ***
Playing on Lawns	1.36	0.37	0.127	0.020	0.0051	0.000068	0.15	66
	0.62	0.17	0.0579	0.0093	0.0023	0.000031	0.070	140
*The NOAEL is 10 mg/kg/day for dermal and incidental oral exposures.								

The myclobutanil MOEs for adult dermal exposures are summarized in Table 11. The dermal MOEs are above 100 regardless of which application rate is used.

Table 11 - Adult MOEs for Exposure to Turf Treated with Myclobutanil				
Exposure Scenario	**Application Rate (lbs ae/acre)**	**Dermal TTR (ug/cm^2)**	**Dermal Dose (mg/kg/day)**	**Dermal MOE***
Heavy Yardwork Playing Golf	1.36	0.37	0.076 0.0052	130 1900
Heavy Yardwork Playing Golf	0.62	0.17	0.035 0.0024	290 4200
*The NOAEL is 10 mg/kg/day				

5.4 Residential Turf Post Application Risk Characterization

The high rate of 1.36 lb ai/acre is from the Eagle 20EW label (62719-463) that appears to be primarily intended for turf use on golf courses because it has the statement "A systemic, protective and curative fungicide for disease control in turfgrass (including golf course fairways, roughs, tee boxes and greens)". With the rate of 1.36 lb ai/acre, the toddler post application risk is of concern at Day 0 (MOE <100) while the adult risk is not of concern.

APPENDIX A

Standard Formulas Used for Assessing Myclobutanil Residential Risks

A. Introduction

This document is a summary of the formulas used to calculate residential exposures to Myclobutanil. These formulas and a basic description of how they are used were taken from References A through E. These references also contain more detailed information on the rationale behind these formulas. Only those formulas that are pertinent to Myclobutanil exposures are discussed in this document.

B. Residential Handler Exposures

The basic rationale for these formulas is that the daily exposure is the product of the amount of active ingredient (a.i.) handled per day times a unit exposure value. The amount of ai handled per day is the product of the application rate times the area treated. For example, if 0.25 lb/acre of Myclobutanil were applied to 1000 square feet (i.e. 0.023 acres) in one day, the amount of Myclobutanil handled that day would be 0.00575 lbs. The unit exposure value is the amount of exposure that results from handling a given amount of active ingredient by a certain method while using certain PPE. For example, the dermal unit exposure value for loading and applying liquids to garden vegetables with a low pressure handwand sprayer is 38 mg per pound of ai handled. In this example, the daily exposure would be 0.00575 lbs ai handled times 38 mg unit exposure per pound of ai handled which equals 0.22 mg per day.

Daily dermal exposure is calculated:

Daily dermal exposure =	Unit exposure	x	Application rate	x	Area Treated
(mg/day)	(mg/lb ai)		(lb ai/acre)		(acres/day)

Where:

Unit exposure =	normalized exposure value (mg exposure per pound ai handled) derived from chemical specific study data or from the PHED Surrogate Exposure Table in Reference A.
Application rate =	normalized application rate based on a logical unit treatment such as acres, a maximum value is generally used (lb ai/acre); and
Area treated =	normalized application area such as acres/day.

[Note: (lb ai/acre) and (A/day) are replaced, respectively, with (lb ai/gal) and (gal/day) when appropriate]

Daily inhalation unit exposure values were calculated for inclusion into the PHED surrogate exposure tables and presented as (Φg/lb ai) based on a human inhalation rate of 29 L/minute and an 8-hour working day.

Daily inhalation exposure is calculated:

Daily inhalation exposure = [Unit exposure x Application rate x Area Treated] / Conversion Factor
(mg/kg/day) (1 mg/1000 ug)

Where:

Unit exposure	=	normalized exposure value (Φg/lb ai handled) derived from study data or PHED;
Application rate	=	same as for dermal exposure (lb ai/acre); and
Daily treatment	=	same as for dermal exposure (acres/day).

Absorbed daily dermal and inhalation doses are then calculated by adjusting for absorption and normalizing by body weight. The adsorption adjustment is needed for both dermal and inhalation exposures because the endpoint is from an oral study. A body weight of 70 kg (average adult body weight) is used because the effects observed were not gender specific.

Absorbed Daily Dose is calculated:

Absorbed daily dermal or inhalation dose = (Daily dermal or inhalation exposure x absorption factor) / body weight
(mg/kg/day) (mg/day) (unitless) (kg)

[Absorption factors of 0.50 and 1.0 were used for dermal and inhalation exposures, respectively.]

The Margin of Exposure (MOE) is calculated using the absorbed daily dose and the NOAEL as shown below:

Margin of Exposure is calculated:

MOE (unitless) = NOAEL (mg/kg/day) / Absorbed Daily Dose (mg/kg/day)

Because Myclobutanil exposures from the dermal and inhalation routes have the same toxicological effects, a combined MOE is calculated from the dermal and inhalations MOEs as shown below:

Combined MOE is Calculated

Combined MOE = 1/(1/Dermal MOE + 1/Inhalation MOE)

C. Home Garden Post Application Exposure

The formulas used to estimate daily dermal dose and the MOE for the dermal post application scenarios are similar to those described above for the handler/applicator scenarios. The only major difference is that the daily dermal exposure is calculated by multiplying the dislodgeable foliar residue level (ug/cm^2 of leaf area) times a transfer coefficient (amount of leaf area contacted per hour for a given activity). Inhalation exposures are not calculated for the post application scenarios because inhalation exposures have been shown to account for a negligible percentage of the overall body burden. This is particularly true for Myclobutanil which has a very low vapor pressure.

The following equation taken from Reference D is used to calculate post application dermal exposures for Myclobutanil.

Post Application Dermal Exposure is calculated:

Dermal exposure (mg/day) = (DFR at day t) x CF1 x TC x # hours/day)

Where:

DFR = dislodgeable foliar residue (ug/cm^2) at day (t) after application
CF1 = conversion factor to convert DFR value in ug/cm^2 to mg/cm^2
TC = *transfer coefficient (cm^2/hour)*
Hours/day = standard assumption is 8 hours exposure per day

Once the post application dermal exposure are calculated, the dermal dose and MOEs are calculated in the similar manner as described for handlers. The target MOE is 100 for residential exposures.

Absorbed Daily Dose is calculated:

Absorbed daily dose (mg/kg/day) = (daily dermal exposure (mg/day) / BW (kg)

Margin of Exposure is calculated:

MOE (unitless) = NOAEL (mg/kg/day) / Absorbed Daily Dose (mg/kg/day)

D. Turf Post Application Exposure

The *SOPs For Residential Exposure Assessment (Reference B)* define several pathways that apply to post application exposure on treated turf. The SOPs and the associated pathways are presented below:

- ***Dose from dermal exposure on treated turf calculated using SOP 2.2:*** Post application dermal dose among toddlers from playing on treated turf, adults working on treated turf and adults playing golf on treated turf;

- ***Dose from hand-to-mouth activity from treated turf calculated using SOP 2.3.2:*** Post application dose among toddlers from incidental non-dietary ingestion of pesticide residues on treated turf from hand-to-mouth transfer (i.e., those residues that end up in the mouth from a child touching turf and then putting their hands in their mouth);

- ***Dose from object-to-mouth activity from treated turf calculated using SOP 2.3.3:*** Post application dose among toddlers from incidental non-dietary ingestion of pesticide residues on treated turf from object-to-mouth transfer (i.e., those residues that end up in the mouth from a child mouthing a handful of treated turf); and

- ***Dose from soil ingestion activity from treated turf calculated using SOP 2.3.4:*** Post application dose among toddlers from incidental non-dietary ingestion of pesticide residues from ingesting soil in a treated turf area (i.e., those soil residues that end up in the mouth from a child touching treated soil and turf then putting their hands in their mouth).

Exposures were calculated by considering the potential sources of exposure (i.e., TTRs on lawns) then calculating dermal exposure, and risks in the same manner as described for the home garden post application risk assessments.

The other aspects of the turf exposure scenario involves calculating dose from non-dietary ingestion that arises from the hand-to-mouth, object-to-mouth and soil ingestion pathways. The algorithms used for each type of calculation are presented below.

Dermal Exposure from Treated Turf

Dermal exposure from treated turf is calculated using the following formula (SOP 2.2):

Dermal exposure (mg/day) = (TTR at day t) x CF1 x TC x DA* x # hours/day)

Where:

TTR = transferable turf residue (ug/cm^2) at day (t) after application
CF1 = conversion factor (0.001) to convert TTR value in ug/cm^2 to mg/cm^2

TC	=	transfer coefficient (cm^2/hour)
DA	=	dermal absorption factor = 50 percent for Myclobutanil*
Hours/day	=	standard assumption is 2 to 4 hours of exposure per day depending upon the activity

In the case of Myclobutanil the TTR data were taken from a submitted study which used the ORETF roller, therefore, the TTR values could be used directly as discussed in Reference B. The transfer coefficients are 500 cm^2/hour for golfing, 5200 cm^2/hour for toddlers playing on treated turf and 14,500 cm^2/hour for adults performing heavy yardwork. An exposure duration of 2 hours per day is used for toddlers playing on treated turf and for adults performing heavy yardwork. An exposure duration of 4 hours per day is used for golfing.

The formula for calculating the dissipation rate using TTR data is as follows:

$TTR_{t=} \ TTR_i * e^{-kt}$

where:

TTRt	=	TTR at time t after application
TTRi	=	TTR initially after application (i.e. at Day 0)
e	=	2.718
k	=	Slope of the regression of the ln transformed TTR values vs time
t	=	Dissipation time after application (days)

Exposures from Hand to Mouth Behavior on Treated Turf:

The following formula illustrates the approach used to calculate the non-dietary ingestion exposures that are attributable to hand-to-mouth behavior on treated turf (SOP 2.3.2).

PDR = TTR * (SE/100) * SA * Freq * Hours * (1 mg/1000 ug)

where:

PDR	=	potential dose rate from hand-to-mouth activity (mg/day);
TTR	=	Turf Transferable Residue where dissipation is based on TTR study and the 0-day value is based on the 5% initial transferability factor ($\Phi g/cm^2$);
SE	=	saliva extraction factor (50%);
SA	=	surface area of the hands (20 cm^2);
Freq	=	frequency of hand-to-mouth events (20 events/hour); and
Hours	=	exposure duration (2 hours).

When used for hand to mouth exposures, the TTR value is based upon the default assumption of 5 percent of the application rate and not the TTR study because the TTR studies do not account for "the sticky hand effect" as discussed in Reference C. The TTR study data are used, however, to determine the dissipation rate.

The formula for calculating the TTR value on Day 0 is given below:

TTR = Application Rate * F * CF1 * CF2 * CF3

Where:

Application Rate	=	lbs ai/acre
F	=	fraction of applied ai that is available for hand to mouth exposure (5 percent)
CF1	=	1.0 lb ai/acre equals 2.3×10^{-5} lbs ai per ft^2
CF2	=	4.54×10^8 ug/lb
CF3	=	0.00108 ft^2/cm^2

Note: CF1 * CF2 * CF3 = 11.23

Exposures from Object to Mouth Behaviors on Treated Turf

The following formula illustrates the approach used to calculate exposures that are attributable to object-to-mouth behavior on treated turf that is represented by a child mouthing on a handful of turf (SOP 2.3.3):

$$PDR = TTR * IGR * (1mg/1000ug)$$

where:

PDR	=	potential dose rate from mouthing activity (mg/day);
TTR	=	Turf Transferable Residue where dissipation is based on TTR study and the 0-day value is based on the 20% initial transferability factor ($\Phi g/cm^2$); and
IgR	=	ingestion rate for mouthing of grass per day (25 cm^2/day).

When used for object to mouth exposures, the TTR value is based upon the default assumption of 20 percent of the application rate and not the TTR study because the TTR studies do not account for "saliva washing effect" as discussed in Reference C. The TTR study is used, however, to determine the dissipation rate.

Exposures from Soil Ingestion on Treated Turf

The following formula illustrates the approach used to calculate exposures that are attributable to soil ingestion (SOP 2.3.4):

$$PDR = SR * IgR * (0.000001 \text{ gm}/ 1 \text{ ug})$$

Where:

PDR	=	dose from soil ingestion activity (mg/day)
SR	=	Soil Residue where dissipation is based on TTR study and the 0-day value is based on the application rate, 1 cm depth of surface soil, and the density of soil ($\Phi g/cm^3$)
IgR	=	ingestion rate for daily soil ingestion (mg/day)

MOE Calculations for Each Pathway

The MOEs are calculated for each individual pathway using the MOE formula:

MOE (unitless) = NOAEL / (Dose /BW)

where
NOAEL = mg/kg/day
Dose = mg/day
BW = 15 kg (toddlers), 70 kg (adults)

MOEs Calculations for All of the Pathways Combined

When assessing adult exposures only the dermal pathway is considered and when assessing toddler exposures all of the pathways considered. The toddler exposures are combined using the MOE approach because the target MOEs are 100 for all of the pathways. The MOE approach is shown below:

Total Dose = (Dermal Dose + Hand-to Mouth Dose + Object to Mouth Dose + Soil Ingestion Dose)/BW

Where:
Total Dose = mg/kg/day
BW = 15 kg for toddlers

The total dose is then used to calculate a Total MOE as shown below.

Total MOE (unitless) = NOAEL / (Total Dose)

References

(A) PHED Surrogate Exposure Guide, V1.1. Health Effects Division, Office of Pesticide Program. August, 1998.

(B) Standard Operating Procedures for Residential Exposure Assessments. U.S. EPA. December 18, 1997.

(C) ExpoSAC SOP #12 "Recommended Revisions to the Standard Operating Procedures (SOPs) for Residential Exposure Assessments. February 22, 2001

(D) Series 875 - Occupational and Residential Exposure Test Guidelines, Group B - Post Application Exposure Monitoring Test Guidelines. U.S. EPA. February 10, 1998.

(E) Overview of Issues Related to the Standard Operating Procedures for Residential Exposure Assessment, Presented to the FIFRA Scientific Advisory Panel on September 1999

Appendix B -
Myclobutanil Home Gardener Handler
Risk Assessment

Table B1: Myclobutanil Residential Handler Unit Exposure Data

Exposure Scenario (Except as Note all are mix/load/apply)	Data Source	Dermal Unit Exposure (mg/lb ai handled)	Inhalation Unit Exposure (ug/lb ai handled)	Comments
1. Aerosol Can Application	PHED	220	2400	N = 30 dermal replicates, ABC grades. Hand replicates = 15, A grade. Medium Confidence. N = 30 Inhalation replicates, ABC grades, Medium Confidence.
2. Hose End Sprayer - Trees and Shrubs	MRID 445185-01 (Carbaryl Data)	39	2.5	This study involved the home owner application of a liquid formulation of carbaryl to young citrus trees and shrubs. 20 replicates per application method were monitored in this study. The clothing scenario represents short-sleeved shirt, short pants, and no gloves. This study was reviewed by Jeff Dawson in Document #D287251. The data are considered high quality by the Agency.
3. Low Pressure Handwand Sprayer - Trees and Shrubs		56	6.5	
4. Low Pressure Handwand Sprayer - Home Garden	MRID 444598-01 (Carbaryl Data)	38	9	This study involved the home owner application of a liquid formulation of carbaryl to tomatoes and cucumbers. 40 replicates per application method were monitored in this study. Half of the replicates wore gloves and the other half did not. The clothing scenario represents short-sleeved shirt, short pants, and no gloves. This study was reviewed by Jeff Dawson in Document #D287251. The data are considered high quality by the Agency.
5. Ready to Use Sprayer- Home Garden		54	67	
6. Hose End Sprayer- Home Garden		34	2.0	
7. Hose-end Sprayer -Turf (Mix your own)	ORETF	11	16	This study involved the application of liquid formulations of Dacthal to residential lawns. It was reviewed by Health Canada and Gary Bangs in Document #D261948. Grade A Data. N = 30 replicates. High Confidence.
8. Hose-end Sprayer -Turf (Ready to Use)		2.6	11	
9 - Belly Grinder Application	PHED	110	62	N = 20 to 45 dermal replicates, ABC grades. Hand replicates = 23, ABC grades. Medium Confidence. N = 40 Inhalation replicates, AB grades, High Confidence.
10. Load/Apply Granules with a Broadcast Spreader	ORETF	0.68	0.91	This study involved the application of a granular formulation of Dacthal to residential lawns. It was reviewed by Health Canada and Gary Bangs in Document #D261948. Grade AB Data. N = 30 replicates. High Confidence despite large variability in results.

Table B2 - Myclobutanil Residential Handler Exposure and Risk

Exposure Scenario (all are mix/load/apply)	Use Site	Application Rate	Amount Used or Area Treated[a]	Amount of Ai Handled[b] (lbs/day)	Dermal Daily Exposure[c] (mg/kg/day)	Inhalation Daily Exposure[d] (mg/day)	Absorbed Daily Dose[e] (mg/kg/day)	MOE[f]
1 - Aerosol Spray Can	Ornamentals	0.012% ai per 15 ounce can	1 can per day	0.00011	1.8e-04	3.9e-06	1.8e-04	55358
2 - Hose End Sprayer	Ornamentals Fruit Trees Nut Trees Grapes	0.25 lb ai/acre	0.023 acre/day (1000 square feet)	0.0058	1.6e-03	2.1e-07	1.6e-03	6242
3 - LP Handwand				0.0058	2.3e-03	5.3e-07	2.3e-03	4347
4 - LP Handwand	Vegetables Berries Mint	0.125 lb ai/acre	0.023 acre/day (1000 square feet)	0.0029	7.8e-04	3.7e-07	7.8e-04	12809
5 - RTU Sprayer				0.0029	1.1e-03	2.8e-06	1.1e-03	8995
6 - Hose End Sprayer				0.0029	7.0e-04	8.2e-08	7.0e-04	14321
7 - Hose End Sprayer - Mix Your Own	Turf	1.36 lb ai/acre	0.5 acre/day	0.68	5.3e-02	1.6e-04	5.4e-02	187
8 - Hose End Sprayer - Ready to Use				0.68	1.3e-02	1.1e-04	1.3e-02	785
7 - Hose End Sprayer - Mix Your Own	Turf	0.62 lb ai/acre	0.5 acre/day	0.31	2.4e-02	7.1e-05	2.4e-02	409
8 - Hose End Sprayer - Ready to Use				0.31	5.8e-03	4.9e-05	5.8e-03	1722
9 - Belly Grinder	Turf	1.36 lb ai/acre	0.023	0.03	2.5e-02	2.8e-05	2.5e-02	406
10 - Broadcast Spreader			0.5	0.68	3.3e-03	8.8e-06	3.3e-03	3020

a. Taken from ExpoSac Policy #12 " Recommended Revisions to the Standard Operating Procedures for Residential Exposure Assessments"
b. lbs ai/day = Application rate (lbs ai/acre) * Area Treated per day (acres/day)
c. Daily Dermal Exposure (mg/day) = lb ai handled per day * Unit Exposure Value (mg exposure/lb ai handled).
d. Daily Inhalation Exposure (mg/day) = lb ai handled per day * Unit Exposure Value (ug exposure/lb ai handled) * 0.001 mg/ug
e. Absorbed Daily Dose (mg/kg/day) = [Daily Exposure (mg/day) * Absorption Factor] / Body Weight (70 kg). The absorption factor is 0.5 for dermal exposures and 1.0 for inhalation exposures.
f. MOE = NOAEL / Absorbed Daily Dose. Where the NOAEL 10 mg/kg/day. The target MOE is 100.

Table B2 - Myclobutanil Residential Handler Exposure and Risk

Exposure Scenario (all are mix/load/apply)	Use Site	Application Rate	Amount Used or Area Treated[a]	Amount of Ai Handled[b] (lbs/day)	Dermal Daily Exposure[c] (mg/kg/day)	Inhalation Daily Exposure[d] (mg/day)	Absorbed Daily Dose[e] (mg/kg/day)	MOE[f]
1 - Aerosol Spray Can	Ornamentals	0.012% ai per 15 ounce can	1 can per day	0.00011	1.8e-04	3.9e-06	1.8e-04	55358
2 - Hose End Sprayer	Ornamentals Fruit Trees Nut Trees Grapes	0.25 lb ai/acre	0.023 acre/day (1000 square feet)	0.0058	1.6e-03	2.1e-07	1.6e-03	6242
3 - LP Handwand				0.0058	2.3e-03	5.3e-07	2.3e-03	4347
4 - LP Handwand	Vegetables Berries Mint	0.125 lb ai/acre	0.023 acre/day (1000 square feet)	0.0029	7.8e-04	3.7e-07	7.8e-04	12809
5 - RTU Sprayer				0.0029	1.1e-03	2.8e-06	1.1e-03	8995
6 - Hose End Sprayer				0.0029	7.0e-04	8.2e-08	7.0e-04	14321
7 - Hose End Sprayer - Mix Your Own	Turf	1.36 lb ai/acre	0.5 acre/day	0.68	5.3e-02	1.6e-04	5.4e-02	187
8 - Hose End Sprayer - Ready to Use				0.68	1.3e-02	1.1e-04	1.3e-02	785
7 - Hose End Sprayer - Mix Your Own	Turf	0.62 lb ai/acre	0.5 acre/day	0.31	2.4e-02	7.1e-05	2.4e-02	409
8 - Hose End Sprayer - Ready to Use				0.31	5.8e-03	4.9e-05	5.8e-03	1722
9 - Belly Grinder	Turf	1.36 lb ai/acre	0.023	0.03	2.5e-02	2.8e-05	2.5e-02	406
10 - Broadcast Spreader			0.5	0.68	3.3e-03	8.8e-06	3.3e-03	3020

a. Taken from ExpoSac Policy #12 " Recommended Revisions to the Standard Operating Procedures for Residential Exposure Assessments"
b. lbs ai/day = Application rate (lbs ai/acre) * Area Treated per day (acres/day)
c. Daily Dermal Exposure (mg/day) = lb ai handled per day * Unit Exposure Value (mg exposure/lb ai handled).
d. Daily Inhalation Exposure (mg/day) = lb ai handled per day * Unit Exposure Value (ug exposure/lb ai handled) * 0.001 mg/ug
e. Absorbed Daily Dose (mg/kg/day) = [Daily Exposure (mg/day) * Absorption Factor] / Body Weight (70 kg). The absorption factor is 0.5 for dermal exposures and 1.0 for inhalation exposures.
f. MOE = NOAEL / Absorbed Daily Dose. Where the NOAEL 10 mg/kg/day. The target MOE is 100.

Appendix C, Spreadsheet 1 - Summary of Myclobutanil DFR and TTR Data

Location	App Rate (lb ai/A)	# of Prior Apps	App Interval	R	Slope of Ln DFR vs. Time	DFR Prior to Last App	DFR at T=0 (ug/cm2)	Half-Life (days)	Day 0 % Trans.
Rohm and Haas DFR Study on Grapes (MRID 404893-02)									
McFarland	0.125	5	16	0.98	-0.096	0.0080	0.158	7.2	10.7
Earlimart	0.125	5	16	0.98	-0.073	0.019	0.180	9.5	11.5
Madera	0.125	5	30	0.93	-0.097	0.079	0.188	7.2	7.8

CA DPR DFR Study on Grapes (HS-1760) Location	App Rate (lb ai/A)	# of Prior Apps	App Interval	R	Slope of Ln DFR vs. Time	Prior DFR	DAT 1 DFR (ug/cm2)	Half-Life (days)	Transfer Efficiency
Site 1	0.10	3 to 4	18	0.96	-0.043	0.084	0.19	16	8.4
Site 5	0.10	3 to 4	18	0.87	-0.042	0.073	0.19	16.5	10.2
Site 4	0.10	3 to 4	18	0.91	-0.076	0.040	0.17	9.1	11.3
Site 3	0.10	0	N/A	0.95	-0.05	N/A	0.26	14	23.5
									13.4

Rohm and Haas TTR Study on North Carolina and California Turf (MRID 449529-01) Location	App Rate (lb ai/A)	# of Prior Apps	App Interval	R	Slope of Ln DFR vs. Time	Prior DFR	DAT 0 DFR (ug/cm2)	Half-Life (days)	Transfer Efficiency
NC	1.31	3	14	0.98	-0.63	0.014	0.16	1.1	1.1
CA	1.31	3	14	0.41	-0.068	0.014	0.36	N/A	2.4
CA	1.31	3	14	0.84	-0.081	0.014	0.35	8.5	2.4

Appendix C, Spreadsheet 2: Rohm and Haas DFR Data for the Mcfarland California Site

DAT	STD DFR (ug/cm2)	LN	Rainfall (inches)
App 1			0
App 2			0
pre App 5	0.008		0
0.083	0.158	-1.85	0
0.333	0.145	-1.93	0
1	0.124	-2.09	0
3	0.116	-2.15	0
5	0.099	-2.31	0
7	0.07	-2.66	0
14	0.028	-3.58	0
21	0.015	-4.20	0
28	0.008	-4.83	0
35	0.007	-4.96	0.0

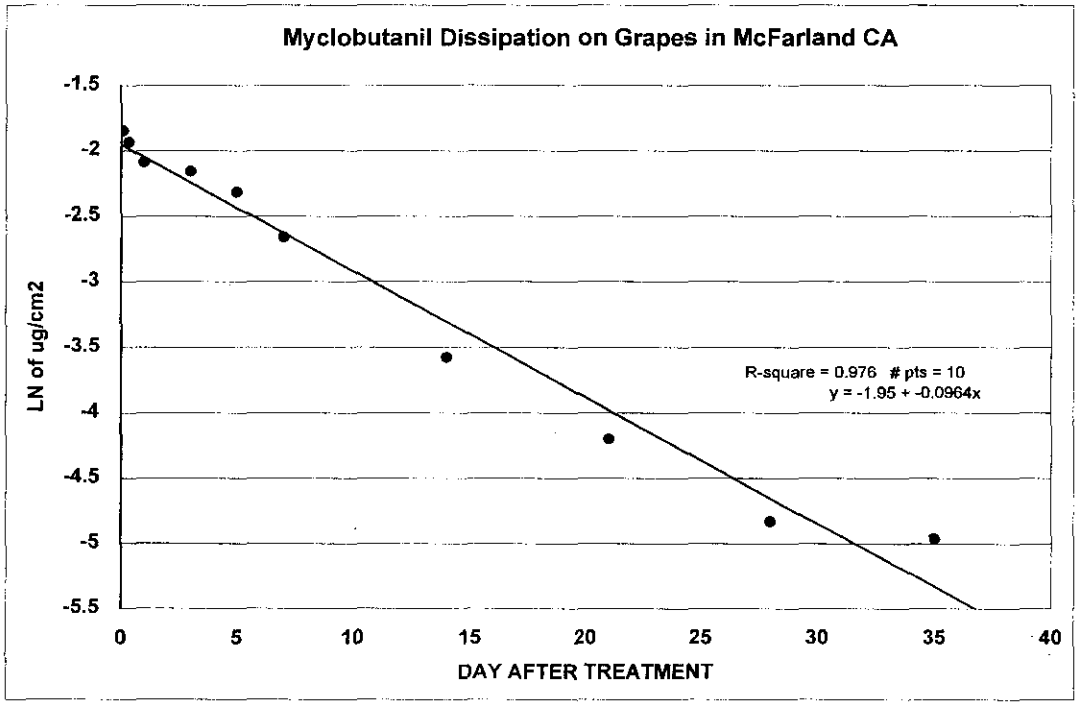
Transfer Efficiency	
(Corrected)	10.7
(Uncorrected)	11.3

Regression Output:

Constant	-1.95
Std Err of Y Est	0.20
R Squared	0.98
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.096
Std Err of Coef.	0.005
Half Life (days)	7.2

Application Method	Airblast
Application Rate (lbs ai/A)	0.094 + 0.094 + 0.094+0.094+0.125
Gallons/Acre	100 to 200
LOD(ug/cm2)	0.0002
Leaf Area(cm2)	608
DFR Final Volume (ml)	300

Field Recovery : Mean = 95, SD = 8 @ 0.025 ug/cm2



Appendix C, Spreadsheet 3: Rohm and Haas DFR Data for the Earlimart California Site

DAT	STD DFR (ug/cm2)	LN	Rainfall (inches)
App 1			0
App 2			0
pre App 5	0.019		0
0.083	0.18	-1.71	0
0.33	0.164	-1.81	0
1	0.15	-1.90	0
3	0.125	-2.08	0
5	0.113	-2.18	0
7	0.104	-2.26	0
14	0.044	-3.12	0
21	0.029	-3.54	0
28	0.025	-3.69	0
35	0.013	-4.34	0.0

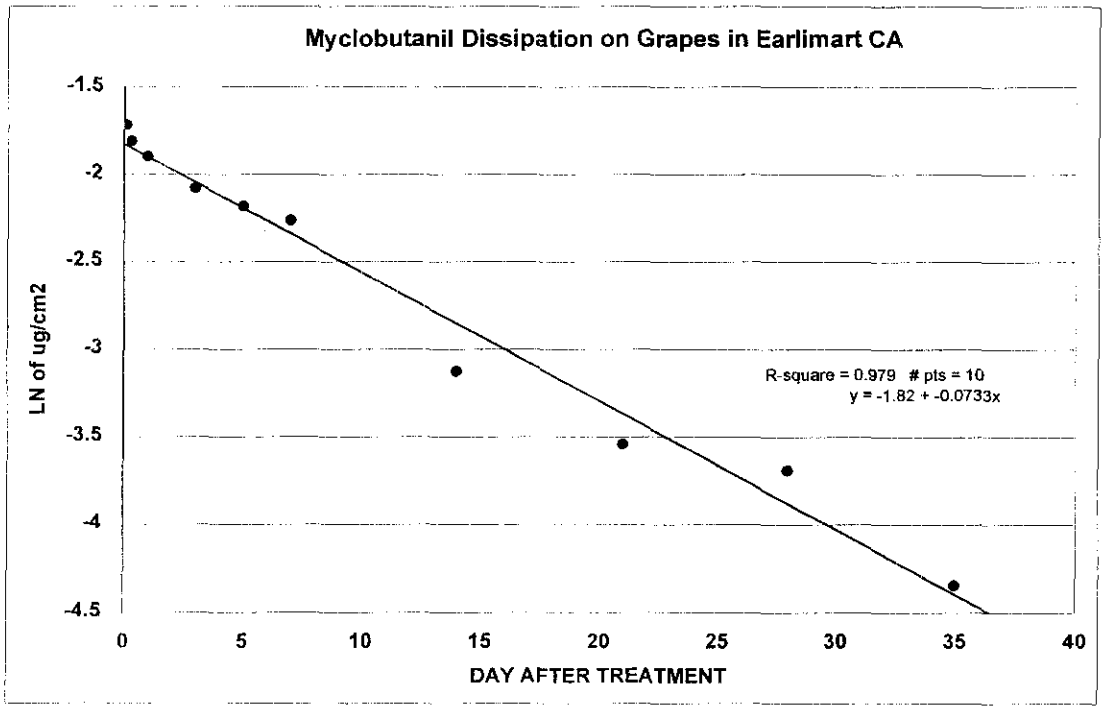
Transfer Efficiency	
(Corrected)	11.5
(Uncorrected)	12.8

Regression Output:

Constant	-1.82
Std Err of Y Est	0.14
R Squared	0.98
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.0733
Std Err of Coef.	0.0038
Half Life (days)	9.5

Application Method	Airblast
Application Rate (lbs ai/A)	0.094 + 0.075 + 0.1125+0.094+0.125
Gallons/Acre	100 to 225
LOD(ug/cm2)	0.0002
Leaf Area(cm2)	608
DFR Final Volume (ml)	300

Field Recovery : Mean = 95, SD = 8 @ 0.025 ug/cm2



Appendix C, Spreadsheet 4: Rohm and Haas DFR Data for the Madera California Site

DAT	STD DFR (ug/cm2)	LN	Rainfall (inches)
App 1			0
App 2			0
pre App 5	0.079		0
0.083	0.188	-1.67	0
0.33	0.173	-1.75	0
1	0.167	-1.79	0
3	0.155	-1.86	0
5	0.067	-2.70	0
7	0.044	-3.12	0
14	0.033	-3.41	0
21	0.013	-4.34	0
28	0.011	-4.51	0
35	0.007	-4.96	0.0

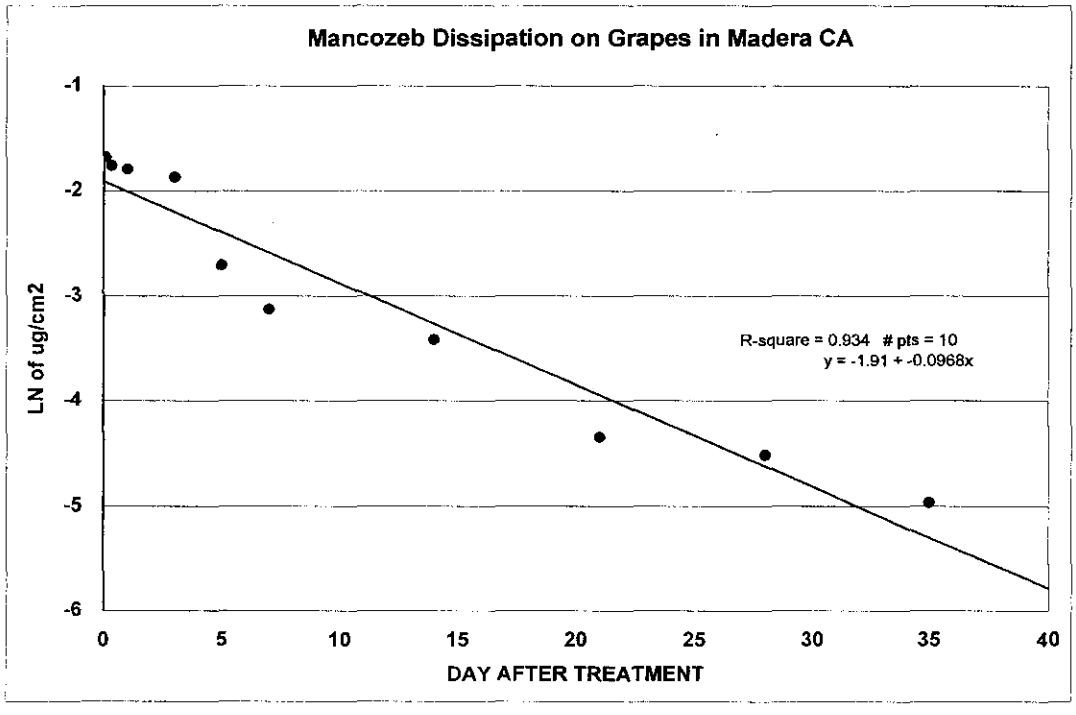
Transfer Efficiency	
(Corrected)	7.8
(Uncorrected)	13.4

Regression Output:

Constant	-1.91
Std Err of Y Est	0.34
R Squared	0.93
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.10
Std Err of Coef.	0.0091
Half Life (days)	7.2

Application Method	Airblast
Application Rate (lbs ai/A)	0.075+0.075+0.1125+0.1125+0.125
Gallons/Acre	40
LOD(ug/cm2)	0.0002
Leaf Area(cm2)	608
DFR Final Volume (ml)	300

Field Recovery : Mean = 95, SD = 8 @ 0.025 ug/cm2

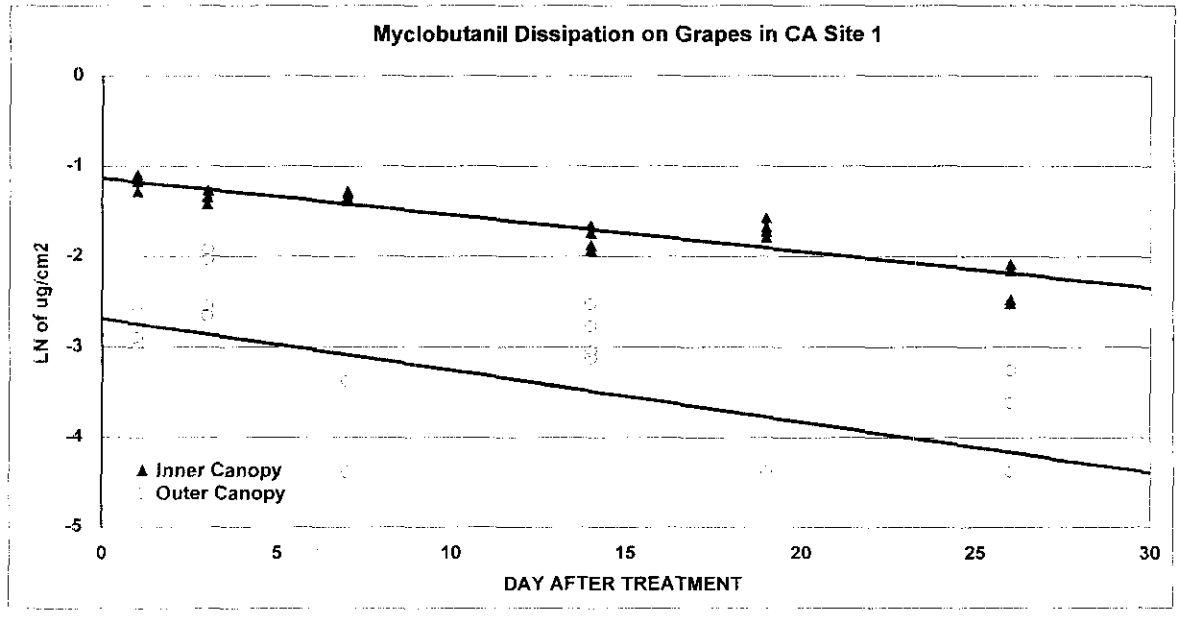


Appendix C, Spreadsheet 5: CADPR Data for Site 1

DAT	Inside Results(ug/ sample)	Inside DFR (ug/cm2)	Inside LN		Outside results (ug/sample)	Outside DFR (ug/cm2)	Outside LN	Avg DFR (ug /cm2)	AVG LN
0	71.7	0.179	-1.72	<	5.0	0.013	-4.34	0.096	-2.34
0	46.9	0.117	-2.14		10.5	0.026	-3.64	0.072	-2.63
1	125.0	0.313	-1.16		22.1	0.055	-2.90	0.184	-1.69
1	112.0	0.280	-1.27		20.0	0.050	-3.00	0.165	-1.80
1	125.0	0.313	-1.16		25.2	0.063	-2.76	0.188	-1.67
1	135.0	0.338	-1.09		31.7	0.079	-2.54	0.208	-1.57
3	96.9	0.242	-1.42		31.5	0.079	-2.54	0.161	-1.83
3	105.0	0.263	-1.34		28.3	0.071	-2.65	0.167	-1.79
3	113.0	0.283	-1.26		52.5	0.131	-2.03	0.207	-1.58
3	96.7	0.242	-1.42		58.9	0.147	-1.92	0.195	-1.64
7	101.0	0.253	-1.38	<	5.0	0.013	-4.38	0.133	-2.02
7	112.0	0.280	-1.27	<	5.0	0.013	-4.38	0.146	-1.92
7	110.0	0.275	-1.29		13.7	0.034	-3.37	0.155	-1.87
7	105.0	0.263	-1.34		13.7	0.034	-3.37	0.148	-1.91
14	58.1	0.145	-1.93		19.1	0.048	-3.04	0.097	-2.34
14	76.6	0.192	-1.65		17.6	0.044	-3.12	0.118	-2.14
14	70.4	0.176	-1.74		32.2	0.081	-2.52	0.128	-2.05
14	61.3	0.153	-1.88		25.2	0.063	-2.76	0.108	-2.22
19	75.1	0.188	-1.67	<	5.0	0.013	-4.38	0.100	-2.30
19	67.1	0.168	-1.79	<	5.0	0.013	-4.38	0.090	-2.41
19	83.3	0.208	-1.57	<	5.0	0.013	-4.38	0.110	-2.20
19	71.5	0.179	-1.72	<	5.0	0.013	-4.38	0.096	-2.35
26	46.4	0.116	-2.15	<	5.0	0.013	-4.38	0.064	-2.74
26	32.1	0.080	-2.52		15.4	0.039	-3.26	0.059	-2.82
26	49.6	0.124	-2.09	<	5.0	0.013	-4.38	0.068	-2.68
26	33.6	0.084	-2.48		10.8	0.027	-3.61	0.056	-2.89

			Inner	Outer	Average
Transfer Efficiency					
(Corrected for DAT 0)	9.1	**DAT 0 DFR**	0.148	0.020	0.084
(Uncorrected)	16.6	**DAT 1 DFR**	0.311	0.062	0.186

		Regression Output:	**Inner**	**Outer**	**Avg**
LOD(ug/cm2)	0.013	Constant	-1.14	-2.69	-1.61
Leaf Area(cm2)	400	*Std Err of Y Est*	0.17	0.67	0.11
DFR Final Volume (ml)	150	R Squared	0.83	0.38	0.93
		No. of Observations	24	24	24
		Degrees of Freedom	22	22	22
		X Coefficient(s)	-0.040	-0.057	-0.043
		Std Err of Coef.	0.004	0.015	0.002

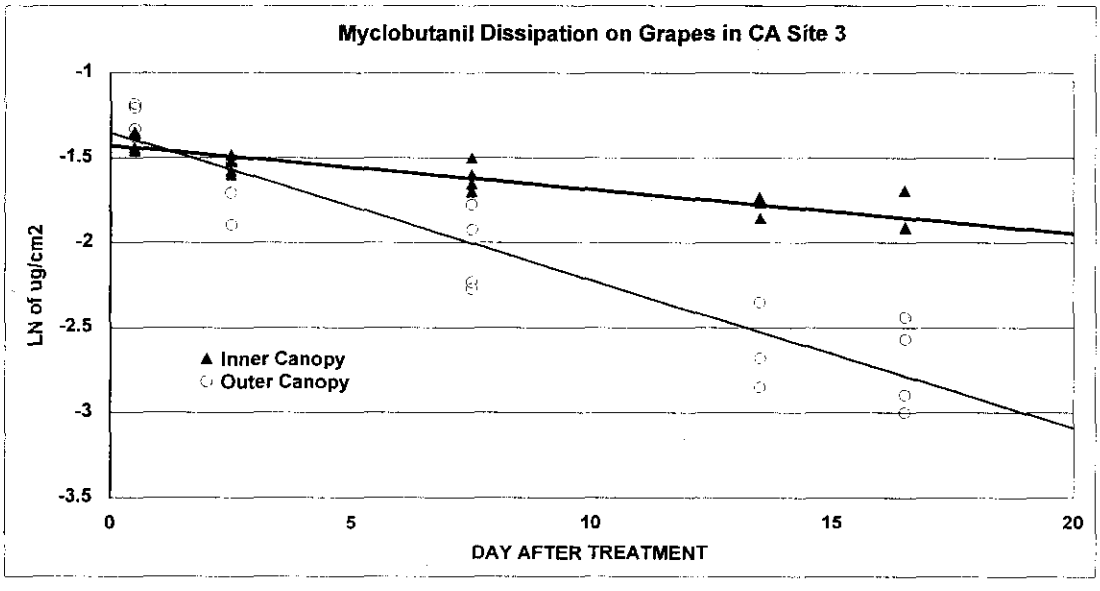


Appendix C, Spreadsheet 6: CADPR Data for Site 3

DAT	Inside Results(ug/ sample)	Inside DFR (ug/cm2)	Inside LN	Outside results (ug/sample)	Outside DFR (ug/cm2)	Outside LN	Avg DFR (ug /cm2)	AVG LN
0.5	93.2	0.233	-1.46	123.0	0.308	-1.18	0.270	-1.31
0.5	104.0	0.260	-1.35	120.0	0.300	-1.20	0.280	-1.27
0.5	103.0	0.258	-1.36	101.0	0.253	-1.38	0.255	-1.37
0.5	94.8	0.237	-1.44	106.0	0.265	-1.33	0.251	-1.38
2.5	80.8	0.202	-1.60	86.1	0.215	-1.54	0.209	-1.57
2.5	82.7	0.207	-1.58	84.9	0.212	-1.55	0.210	-1.56
2.5	90.9	0.227	-1.48	72.6	0.182	-1.71	0.204	-1.59
2.5	87.6	0.219	-1.52	60.2	0.151	-1.89	0.185	-1.69
7.5	89.3	0.223	-1.50	67.7	0.169	-1.78	0.196	-1.63
7.5	76.5	0.191	-1.65	58.5	0.146	-1.92	0.169	-1.78
7.5	73.2	0.183	-1.70	41.3	0.103	-2.27	0.143	-1.94
7.5	80.9	0.202	-1.60	43.0	0.108	-2.23	0.155	-1.87
13.5	62.6	0.157	-1.85	38.1	0.095	-2.35	0.126	-2.07
13.5	70.9	0.177	-1.73	38.1	0.095	-2.35	0.136	-1.99
13.5	70.0	0.175	-1.74	23.1	0.058	-2.85	0.116	-2.15
13.5	68.6	0.172	-1.76	27.4	0.069	-2.68	0.120	-2.12
16.5	59.4	0.149	-1.91	34.9	0.087	-2.44	0.118	-2.14
16.5	73.7	0.184	-1.69	30.7	0.077	-2.57	0.131	-2.04
16.5	59.0	0.148	-1.91	19.9	0.050	-3.00	0.099	-2.32
16.5	59.3	0.148	-1.91	22.1	0.055	-2.90	0.102	-2.29

			Inner	Outer	Average
Transfer Efficiency (Uncorrected)	23.5	**DAT 0.5**	0.247	0.281	0.264

		Regression Output:	**Inner**	**Outer**	**Avg**
		Constant	-1.43	-1.35	-1.40
LOD(ug/cm2)	0.005	Std Err of Y Est	0.08	0.21	0.11
Leaf Area(cm2)	400	R Squared	0.83	0.88	0.90
DFR Final Volume (ml)	150	No. of Observations	20	20	20
		Degrees of Freedom	18	18	18
		X Coefficient(s)	-0.026	-0.087	-0.050
		Std Err of Coef.	0.003	0.008	0.004

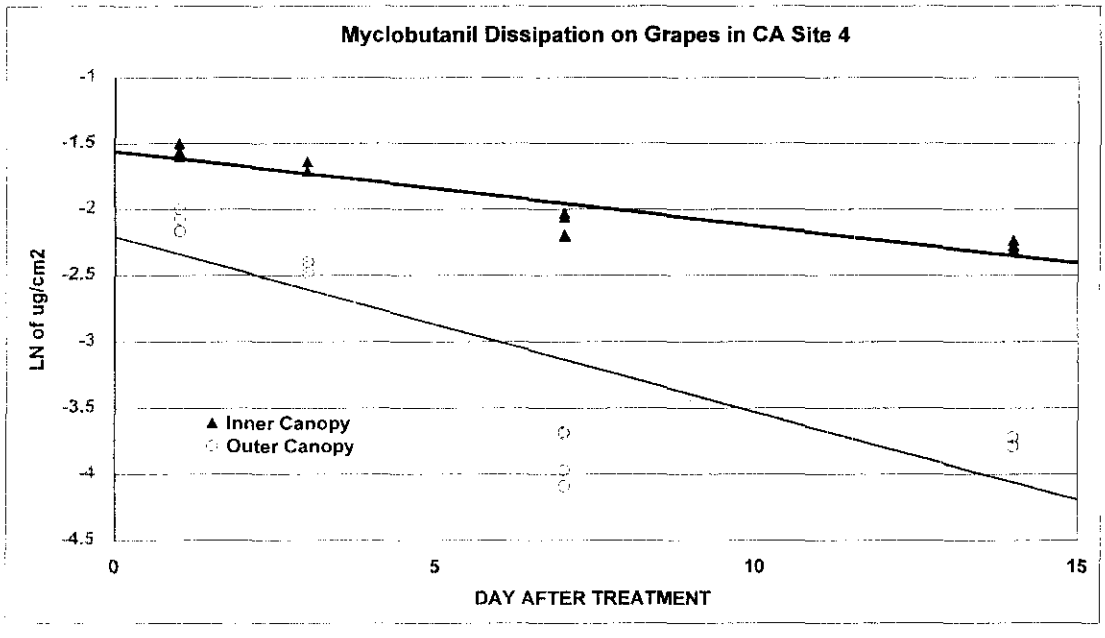


Appendix C, Spreadsheet 7: CADPR Data for Site 4

DAT	Inside Results(ug/ sample)	Inside DFR (ug/cm2)	Inside LN	Outside results (ug/sample)	Outside DFR (ug/cm2)	Outside LN	Avg DFR (ug /cm2)	AVG LN
0	21.6	0.054	-2.92	2.5	0.006	-5.08	0.030	-3.50
0	23.4	0.059	-2.84	3.9	0.010	-4.63	0.034	-3.38
0	32.7	0.082	-2.50	7.0	0.018	-4.05	0.050	-3.00
0	28.5	0.071	-2.64	8.8	0.022	-3.82	0.047	-3.07
1	84.0	0.210	-1.56	46.0	0.115	-2.16	0.163	-1.82
1	80.9	0.202	-1.60	54.4	0.136	-2.00	0.169	-1.78
1	89.3	0.223	-1.50	50.4	0.126	-2.07	0.175	-1.75
1	83.8	0.210	-1.56	45.9	0.115	-2.16	0.162	-1.82
3	72.3	0.181	-1.71	36.6	0.092	-2.39	0.136	-1.99
3	72.3	0.181	-1.71	33.5	0.084	-2.48	0.132	-2.02
3	72.5	0.181	-1.71	35.1	0.088	-2.43	0.135	-2.01
3	77.9	0.195	-1.64	36.3	0.091	-2.40	0.143	-1.95
7	44.7	0.112	-2.19	6.7	0.017	-4.09	0.064	-2.74
7	52.6	0.132	-2.03	10.1	0.025	-3.68	0.078	-2.55
7	44.1	0.110	-2.21	7.6	0.019	-3.97	0.065	-2.74
7	51.0	0.128	-2.06	10.0	0.025	-3.69	0.076	-2.57
14	41.2	0.103	-2.27	9.1	0.023	-3.78	0.063	-2.77
14	39.9	0.100	-2.31	9.7	0.024	-3.72	0.062	-2.78
14	42.9	0.107	-2.23	9.1	0.023	-3.79	0.065	-2.73
14	39.8	0.100	-2.31	9.7	0.024	-3.72	0.062	-2.78

			Inner	Outer	Average
Transfer Efficiency		**DAT 0**	0.066	0.014	0.040
(Corrected for DAT 0)	11.3	**DAT 1**	0.211	0.123	0.167
(Uncorrected for DAT 0)	14.9				

		Regression Output:	**Inner**	**Outer**	**Avg**
LOD(ug/cm2)	0.005	Constant	-1.56	-2.21	-1.82
Leaf Area(cm2)	400	Std Err of Y Est	0.12	0.46	0.19
DFR Final Volume (ml)	150	*R Squared*	*0.87*	*0.70*	*0.82*
		No. of Observations	16	16	16
		Degrees of Freedom	14	14	14
		X Coefficient(s)	-0.057	-0.132	-0.076
		Std Err of Coef.	0.006	0.023	0.010

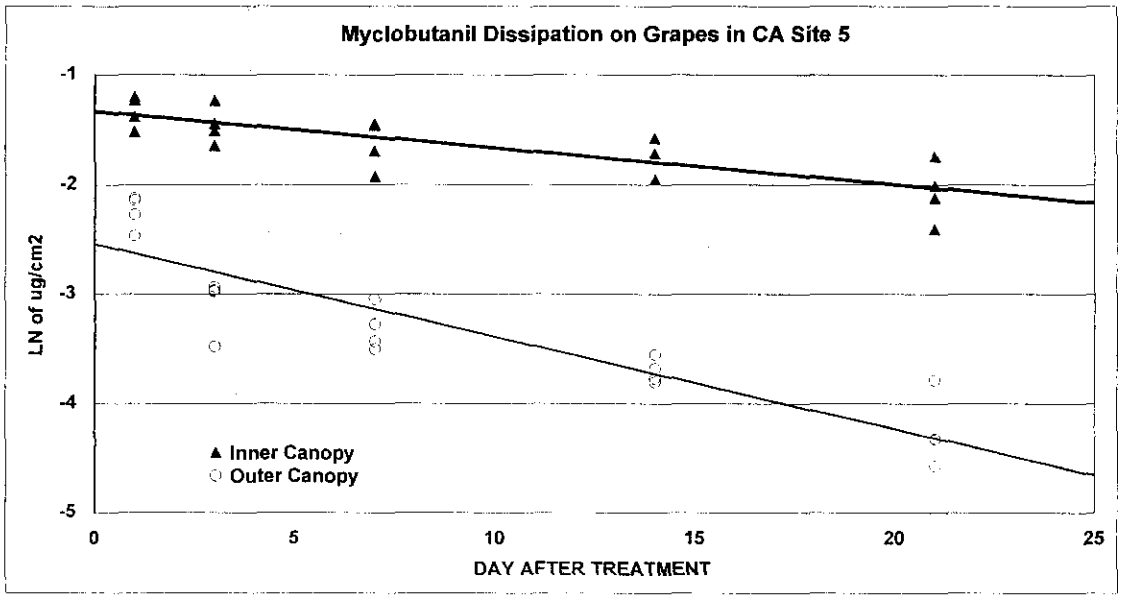


Appendix C, Spreadsheet 8: CADPR Data for Site 5

DAT	Inside Results (ug/sample)	Inside DFR (ug/cm2)	Inside LN		Outside results (ug/sample)	Outside DFR (ug/cm2)	Outside LN	Avg DFR (ug /cm2)	AVG LN
0	50.8	0.127	-2.06		6.3	0.016	-4.15	0.071	-2.64
0	65.0	0.163	-1.82	<	3.0	0.008	-4.89	0.085	-2.47
0	66.1	0.165	-1.80		4.0	0.010	-4.61	0.088	-2.44
0	33.9	0.085	-2.47	<	3.0	0.008	-4.89	0.046	-3.08
1	121.0	0.303	-1.20		47.2	0.118	-2.14	0.210	-1.56
1	117.0	0.293	-1.23		34.0	0.085	-2.47	0.189	-1.67
1	88.0	0.220	-1.51		41.3	0.103	-2.27	0.162	-1.82
1	101.0	0.253	-1.38		48.1	0.120	-2.12	0.186	-1.68
3	95.0	0.238	-1.44		21.4	0.054	-2.93	0.146	-1.93
3	117.0	0.293	-1.23		12.4	0.031	-3.47	0.162	-1.82
3	77.6	0.194	-1.64		20.7	0.052	-2.96	0.123	-2.10
3	89.1	0.223	-1.50		20.5	0.051	-2.97	0.137	-1.99
7	94.6	0.237	-1.44		15.2	0.038	-3.27	0.137	-1.99
7	93.6	0.234	-1.45		13.0	0.033	-3.43	0.133	-2.02
7	73.9	0.185	-1.69		19.1	0.048	-3.04	0.116	-2.15
7	58.6	0.147	-1.92		12.1	0.030	-3.50	0.088	-2.43
14	83.1	0.208	-1.57		11.5	0.029	-3.55	0.118	-2.13
14	83.0	0.208	-1.57		9.2	0.023	-3.77	0.115	-2.16
14	57.0	0.143	-1.95		9.0	0.022	-3.80	0.082	-2.50
14	72.3	0.181	-1.71		10.1	0.025	-3.68	0.103	-2.27
21	53.7	0.134	-2.01		9.1	0.023	-3.78	0.079	-2.54
21	70.3	0.176	-1.74		4.1	0.010	-4.57	0.093	-2.37
21	48.1	0.120	-2.12		5.3	0.013	-4.33	0.067	-2.71
21	36.2	0.091	-2.40		5.3	0.013	-4.32	0.052	-2.96

			Inner	Outer	Average
Transfer Efficiency					
(Based upon Inner DFR)	10.2	**DAT 0**	0.135	0.010	0.073
(Based upon Outer DFR)	16.6	**DAT 1**	0.267	0.107	0.187

		Regression Output:	Inner	Outer	Avg
LOD(ug/cm2)	0.008	Constant	-1.33	-2.54	-1.75
Leaf Area(cm2)	400	Std Err of Y Est	0.20	0.32	0.18
DFR Final Volume (ml)	150	R Squared	0.64	0.81	0.76
		No. of Observations	20	20	20
		Degrees of Freedom	18	18	18
		X Coefficient(s)	-0.033	-0.085	-0.042
		Std Err of Coef.	0.006	0.010	0.006



Appendix C, Spreadsheet 9: Rohm and Haas TTR Data for the NC Site

DAT		Myclobutanil Raw Data (ug/cm2)	Myclobutanil Adjusted (ug/cm2)	LN	Cumulative Rainfall (inches)
Pre	<	0.014			
0		0.154	0.158	-1.85	0
0		0.170	0.174	-1.75	
0		0.186	0.190	-1.66	
0.30		0.189	0.193	-1.64	0
0.30		0.109	0.112	-2.19	
0.30		0.131	0.134	-2.01	
1		0.069	0.071	-2.65	0
1		0.130	0.133	-2.02	
1		0.118	0.121	-2.11	
4	<	0.014	0.014	-4.25	0.11
4	<	0.014	0.014	-4.25	
4	<	0.014	0.014	-4.25	
5	<	0.014	0.014	-4.25	0.11
5	<	0.014	0.014	-4.25	
5	<	0.014	0.014	-4.25	
7	<	0.014	0.014	-4.25	0.20
7	<	0.014	0.014	-4.25	
7	<	0.014	0.014	-4.25	
10	<	0.014	0.014	-4.25	0.38
10	<	0.014	0.014	-4.25	
10	<	0.014	0.014	-4.25	
14	<	0.014	0.014	-4.25	0.79
14	<	0.014	0.014	-4.25	
14	<	0.014	0.014	-4.25	

Application Method
Application Rate (lbs ai/A)
Gallons/Acre

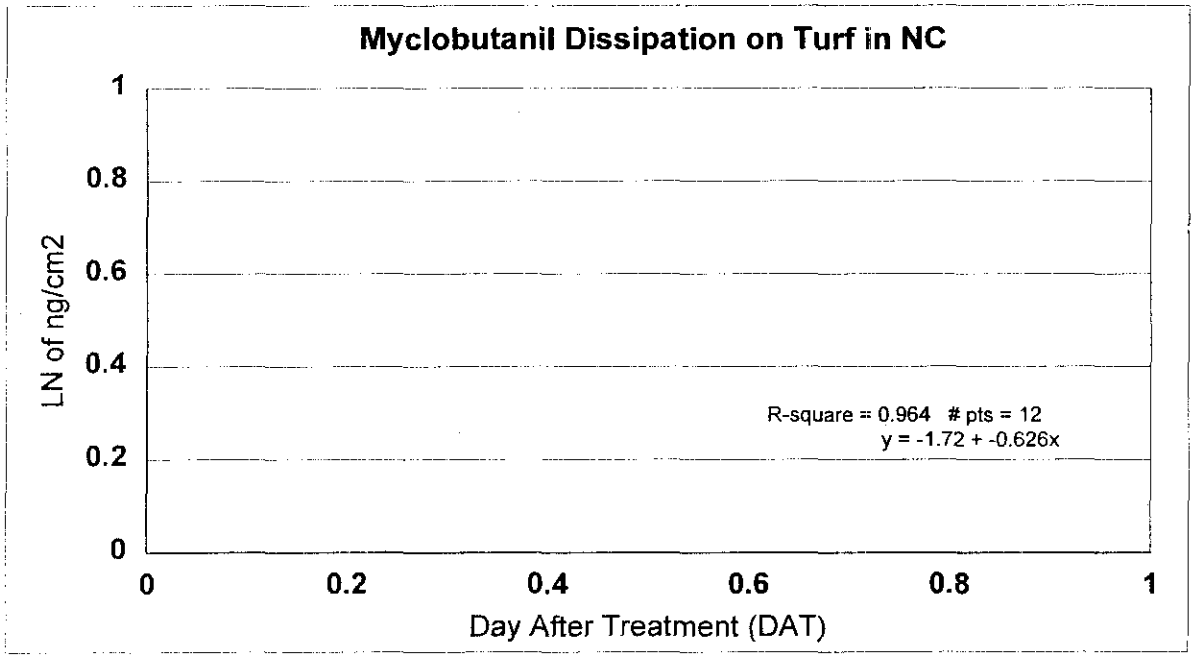
LOQ(ug/cm2)
LOD(ug/cm2)
Exposed Cloth Area (cm2)

	Avg TTR
DAT 0.0	0.17
DAT 0.3	0.15

Field Recovery
(Percent) 91.6 @ 0.018 ug/cm2 (n=6, SD = 6.4)
94.6 @ 0.90 ug/cm2 (n=6, SD = 2.6)
93.7 @ CA (n=6, SD = 4.7)
92.4 @ NC (n=6, SD = 5.4)

Regression Output:	
Constant	-1.72
Std Err of Y Est	0.21
R Squared	0.96
No. of Observations	12
Degrees of Freedom	10
X Coefficient(s)	-0.626
Std Err of Coef.	0.038
Half Life (days)	1.11

TTR values were corrected for method recovery of 97.7 percent



Appendix C, Spreadsheet 10: Rohm and Haas TTR Data for the Ca Site (All data included)

DAT		Myclobutanil Raw Data (ug/cm2)	Myclobutanil Adjusted (ug/cm2)	LN	Cumulative Irrigation (inches)
Pre	<	0.014	0.014		
0		0.361	0.369	-1.00	0
0		0.336	0.344	-1.07	
0		0.186	0.190	-1.66	
0.30		0.323	0.331	-1.11	0
0.30		0.348	0.356	-1.03	
0.30		0.547	0.560	-0.58	
1		0.381	0.390	-0.94	0
1		0.350	0.358	-1.03	
1		0.315	0.322	-1.13	
2		0.318	0.325	-1.12	0
2		0.265	0.271	-1.30	
2		0.333	0.341	-1.08	
4		0.276	0.282	-1.26	0
4		0.243	0.249	-1.39	
4		0.247	0.253	-1.38	
7	<	0.014	0.014	-4.25	0.75
7	<	0.014	0.014	-4.25	
7	<	0.014	0.014	-4.25	
10	<	0.014	0.014	-4.25	1.5
10	<	0.014	0.014	-4.25	
10	<	0.014	0.014	-4.25	
14	<	0.014	0.014	-4.25	2.25
14	<	0.014	0.014	-4.25	
14	<	0.014	0.014	-4.25	

Application Method	Groundboom
Application Rate (lbs ai/A)	1.31
Gallons/Acre	43.6
LOQ(ug/cm2)	0.027
LOD(ug/cm2)	0.009
Exposed Cloth Area (cm2)	5574

	Avg TTR	Percent TTR
DAT 0.0	0.30	2.1
DAT 0.3	0.42	2.8
DAT 0 AVG	0.36	2.4

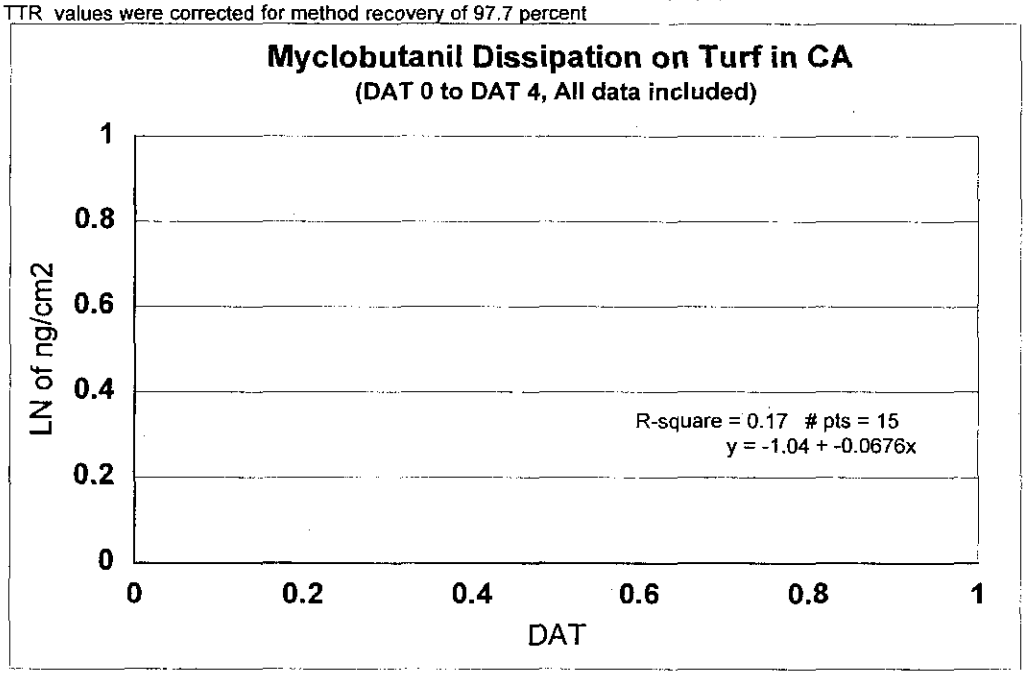
Field Recovery

(Percent) 91.6 @ 0.018 ug/cm2 (n=6, SD = 6.4)
94.6 @ 0.90 ug/cm2 (n=6, SD = 2.6)
93.7 @ CA (n=6, SD = 4.7)
92.4 @ NC (n=6, SD = 5.4)

Regression Output: (Day 0 to 5)

Constant	-0.66
Std Err of Y Est	0.62
R Squared	0.76
No. of Observations	18
Degrees of Freedom	16
X Coefficient(s)	-0.418
Std Err of Coef.	0.059
Half Life (days)	1.66

TTR values were corrected for method recovery of 97.7 percent



Appendix C, Spreadsheet 11: Rohm and Haas TTR Data for the Ca Site (Outliers Excluded)

DAT		Myclobutanil Raw Data (ug/cm2)	Myclobutanil Adjusted (ug/cm2)	LN	Cumulative Irrigation (inches)
Pre	<	0.014	0.014		
0		0.361	0.369	-1.00	0
0		0.336	0.344	-1.07	
0.30		0.323	0.331	-1.11	0
0.30		0.348	0.356	-1.03	
1		0.381	0.390	-0.94	0
1		0.350	0.358	-1.03	
1		0.315	0.322	-1.13	
2		0.318	0.325	-1.12	0
2		0.265	0.271	-1.30	
2		0.333	0.341	-1.08	
4		0.276	0.282	-1.26	0
4		0.243	0.249	-1.39	
4		0.247	0.253	-1.38	
7	<	0.014	0.014	-4.25	0.75
7	<	0.014	0.014	-4.25	
7	<	0.014	0.014	-4.25	
10	<	0.014	0.014	-4.25	1.5
10	<	0.014	0.014	-4.25	
10	<	0.014	0.014	-4.25	
14	<	0.014	0.014	-4.25	2.25
14	<	0.014	0.014	-4.25	
14	<	0.014	0.014	-4.25	

DAT	AVG LN
0	-1.03
0.3	-1.07
1	-1.03
2	-1.17
4	-1.34

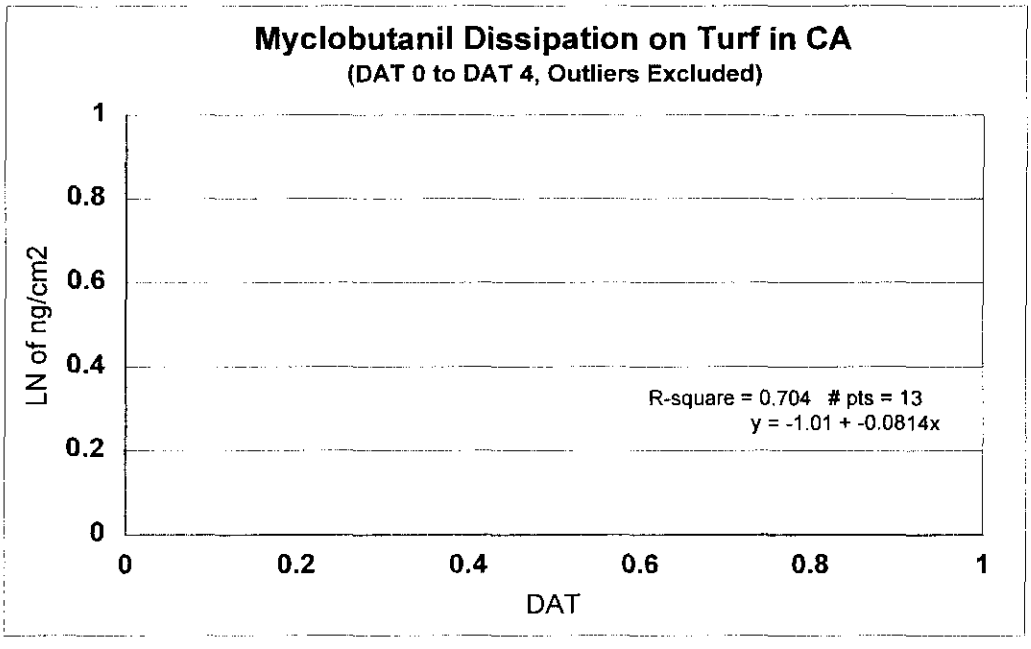
Application Method	Groundboom
Application Rate (lbs ai/A)	1.31
Gallons/Acre	43.6
LOQ(ug/cm2)	0.027
LOD(ug/cm2)	0.009
Exposed Cloth Area (cm2)	5574

	Avg TTR	Percent TTR
DAT 0.0	0.36	2.4
DAT 0.3	0.34	2.3
DAT 0 AVG	0.35	2.4

Field Recovery

(Percent) 91.6 @ 0.018 ug/cm2 (n=6, SD = 6.4)
94.6 @ 0.90 ug/cm2 (n=6, SD = 2.6)
93.7 @ CA (n=6, SD = 4.7)
92.4 @ NC (n=6, SD = 5.4)

Regression Output:	All Data	Avg
Constant	-1.01	-1.01
Std Err of Y Est	0.08	0.04
R Squared	0.70	0.93
No. of Observations	13	5
Degrees of Freedom	11	3
X Coefficient(s)	-0.081	-0.079
Std Err of Coef.	0.016	0.013
Half Life (days)	8.52	8.80



Appendix D - Myclobutanil Home Garden and Pick Your Own Crops Post Application Risk Assessment
Spreadsheet 1 - Input Values

Date: 01/23/06
Assessor: Timothy C. Dole

Scenario:	Spreadsheet
Home Garden (Ornamental Plants and Vegetables)	2
Home Orchard (Tree Fruit)	3
Pick Your Own Orchard Crops	4
Pick Your Own Strawberries	5

Toxicology & Exposure Factor Inputs:	
Uncertainty Factor:	100
NOAEL (mg/kg/day):	10
Adult Exposure Duration for Home Garden and Orchard (hrs/day):	0.67
Adult Exposure Duration for Pick Your Own Strawberries (hrs/day):	4
Adult Exposure Duration for Pick Your Own Orchard Crops (hrs/day):	2
Adult Body Weight (kg):	70
Dermal Absorption (Percent):	50

Appendix D - Myclobutanil Home Garden and Pick Your Own Crops Post Application Risk Assessment
Spreadsheet 2 - Home Garden

Scenario	Home Garden
Specific Crop(s) Considered:	Ornamental Plants and Vegetables
Application Rate of Crop (lb ai/A):	0.25

DFR Data Summary

Data Source (enter 1 if data available, 0 if d	1
Source:	HS-1760 Site 3
Slope of Semilog Regression:	-0.050
[Initial] (ug/cm2):	0.26
Study Application Rate (lb ai/A):	0.1
Limit of Detection (ug/cm2):	0.0002

Transfer Coefficients (cm2/hour)	Activities
10000	Misc Home Garden Tasks (SOP)

DAT	DFR Levels (ug/cm2)	DOSE (mg/kg/day)	MOE
0	0.650	0.031	321

Appendix D - Myclobutanil Home Garden and Pick Your Own Crops Post Application Risk Assessment
Spreadsheet 3 - Home Orchard

Scenario	Home Orchard
Specific Crop(s) Considered:	Apple, Mayhaw, Apricot, Nectarine, Cherry, Peach, Plum and Prune
Application Rate of Crop (lb ai/A):	0.25

DFR Data Summary

Data Source (enter 1 if data available, 0 if d	1
Source:	HS-1760 Site 3
Slope of Semilog Regression:	-0.050
[Initial] (ug/cm2):	0.26
Study Application Rate (lb ai/A):	0.1
Limit of Detection (ug/cm2):	0.0002

Transfer Coefficients (cm2/hour)	Activities
10000	Misc Home Orchard Tasks (SOP)

DAT	DFR Levels (ug/cm2)	DOSE (mg/kg/day)	MOE
0	0.650	0.031	321

Appendix D - Myclobutanil Home Garden and Pick Your Own Crops Post Application Risk Assessment
Spreadsheet 4 - Pick Your Own Orchard

Scenario	Pick Your Own Orchard
Specific Crop(s) Considered:	Apple, Mayhaw, Apricot, Nectarine, Cherry, Peach, Plum and Prune
Application Rate of Crop (lb ai/A):	0.25

DFR Data Summary

Data Source (enter 1 if data available, 0 if d	1
Source:	HS-1760 Site 3
Slope of Semilog Regression:	-0.050
[Initial] (ug/cm2):	0.26
Study Application Rate (lb ai/A):	0.1
Limit of Detection (ug/cm2):	0.0002

Transfer Coefficients (cm2/hour)	Activities
10000	Hand Harvesting

DAT	DFR Levels (ug/cm2)	DOSE (mg/kg/day)	MOE
0	0.650	0.093	108
1	0.618	0.088	113

Appendix D - Myclobutanil Home Garden and Pick Your Own Crops Post Application Risk Assessment
Spreadsheet 5 - Pick your Own Strawberries

Scenario	Pick Your Own
Specific Crop(s) Considered:	Strawberries
Application Rate of Crop (lb ai/A):	0.125

DFR Data Summary

Data Source (enter 1 if data available, 0 if d	1
Source:	HS-1760 Site 3
Slope of Semilog Regression:	-0.050
[Initial] (ug/cm2):	0.26
Study Application Rate (lb ai/A):	0.1
Limit of Detection (ug/cm2):	0.0002

Transfer Coefficients (cm2/hour)	Activities
10000	Hand Harvesting (SOP)

DAT	DFR Levels (ug/cm2)	DOSE (mg/kg/day)	MOE
0	0.325	0.093	108
1	0.309	0.088	113

Appendix E - Residential Turf Post Application Risk Assessment for Myclobutanil

Spreadsheet 1: Input Values	High Rate	Low Rate
Label Application Rate (lb ai/acre):	1.36	0.62
Study Application Rate (lb ai/acre):	1.30	1.30
Limit of Quantification (ug/cm2):	0.027	0.027
Transferable Residue (% of Rate) for Dermal Exposures (Based upon TTR Data)	2.4	2.4
Transferable Residue (% of Rate) for Hand-to-Mouth Ingestion Exposures (SOP default)	5	5
Transferable Residue (% of Rate) for Object-to-Mouth Ingestion Exposures (SOP default)	20	20
Predicted Time (0) TTR for Dermal Exposure (ug/cm2) based upon label rate:	0.37	0.17
Predicted Time (0) TTR for Hand-to-Mouth Ingestion (ug/cm2) based upon label rate:	0.76	0.35
Predicted Time (0) TTR for Object-to-Mouth Ingestion (ug/cm2) based upon label rate:	3.1	1.4
Predicted Time (0) Total Deposition for Soil Ingestion (ug/cm2) based upon label rate:	15.3	7.0
TTR Data Source:	449529-01	
Slope Factor:	-0.081	
Maximum TTR	N/A	
Initial TTR for DAT 0	0.37	0.17
Adult Dermal Exposure Duration On Lawns (hr/day):	2	
Toddler Dermal Exposure Duration On Lawns (hr/day):	2	
Toddler Hand-to-Mouth Duration On Lawns (hr/day):	2	
Adult Dermal Exposure Duration While Golfing (hr/day):	4	
Adult Dermal TC On Lawns (cm2/hr):	14500	
Adult Dermal TC While Golfing (cm2/hr):	500	
Toddler Dermal TC On Lawns (cm2/hr):	5200	
Toddler Hand Surface Area (cm2/both hands):	20	
Toddler Short-Term Frequency of Hand-to-Mouth Events (events/hour):	20	
Object-to-Mouth Surface Area Contacted (cm2 mouthed):	25	
Soil Ingestion (mg soil ingested/day):	100	
Soil Density (cm3/gram):	0.67	
Saliva Extraction Factor (50 percent/100):	0.5	
Uncertainty Factor:	100	
Oral NOAEL (mg/kg/day) for Dermal and Incidental Oral Exposures:	10	
Adult Body Weight (kg)	70	
Toddler Body Weight (kg):	15	
Dermal Absorption Factor (DA)	0.5	

Appendix E - Residential Turf Post Application Risk Assessment for Myclobutanil

Spreadsheet 2: Risk Calculations and MOEs for the High Rate of 1.36 lb ai/acre

Turf and Soil Residue Levels

DAT	TTR for Dermal	TTR for HTM Ingestion	TTR for OTM Ingestion	[Soil] For Ingestion
	(ug/cm2)	(ug/cm2)	(ug/cm2)	(ppm)
0	0.366	0.76	3.1	10.2
1	0.34	0.70	2.81	9.43
2	0.31	0.65	2.60	8.69
3	0.29	0.60	2.39	8.02
4	0.26	0.55	2.21	7.39
5	0.24	0.51	2.04	6.82
6	0.23	0.47	1.88	6.29
AVG	0.291	0.61	2.4	8.1

Adult Short/Intermediate Term MOEs

DAT	Yardwork		Golfing	
	Dose	MOE	Dose	MOE
0	0.0759	132	0.00523	1911

Toddler Short/Intermediate Term MOEs

DAT	Dermal Exposure		Hand to Mouth (HTM) Exposure		Object to Mouth (OTM) Exposure		Soil Ingestion Exposure		Combined Exposure	
	Dose	MOE	Dose	MOE	Dose	MOE	Dose	MOE	Dose	MOE
0	0.1270	79	0.0203	492	0.0051	1966	6.8E-005	146718	1.5E-001	66
AVG	0.1009	99	0.0162	619	0.0040	2474	5.4E-005	184644	1.2E-001	83

Note: Doses are in mg/kg/day

Appendix E - Residential Turf Post Application Risk Assessment for Myclobutanil

Spreadsheet 3: Risk Calculations and MOEs for the Low Rate of 0.62 lb ai/acre

Turf and Soil Residue Levels

DAT	TTR for Dermal	TTR for HTM Ingestion	TTR for OTM Ingestion	[Soil] For Ingestion
	(ug/cm2)	(ug/cm2)	(ug/cm2)	(ppm)
0	0.167	0.35	1.4	4.7
1	0.15	0.32	1.28	4.30
2	0.14	0.30	1.18	3.96
3	0.13	0.27	1.09	3.66
4	0.12	0.25	1.01	3.37
5	0.11	0.23	0.93	3.11
6	0.10	0.21	0.86	2.87
AVG	0.133	0.28	1.1	3.7

Adult Short/Intermediate Term MOEs

DAT	Yardwork		Golfing	
	Dose	MOE	Dose	MOE
0	0.0346	289	0.00239	4193

Toddler Short/Intermediate Term MOEs

DAT	Dermal Exposure		Hand to Mouth (HTM) Exposure		Object to Mouth (OTM) Exposure		Soil Ingestion Exposure		Combined Exposure	
	Dose	MOE	Dose	MOE	Dose	MOE	Dose	MOE	Dose	MOE
0	0.0579	173	0.0093	1078	0.0023	4313	3.1E-005	321834	7.0E-002	144
AVG	0.0460	217	0.0074	1357	0.0018	5427	2.5E-005	405025	5.5E-002	181

Note: Doses are in mg/kg/day

13544

R128702

Chemical: Myclobutanil

PC Code: 128857

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